NETWORK WORLD

THE WEEKLY FOR LEADING USERS OF COMMUNICATIONS PRODUCTS & SERVICES VOLUME 4, NUMBER 23 JUNE 8, 1987

▶ *PBX DISTRIBUTION*

Northern may shed Eastern sales unit

BY BOB WALLACE
Senior Editor

NASHVILLE, Tenn. — Northern Telecom, Inc. is negotiating with Nynex Corp. to sell its Eastern region direct sales and service unit to the RBHC, a high-ranking official of the switch maker told *Network World* last week.

The source said Northern Telecom is involved in talks with Nynex Business Information Systems Corp., the RBHC's equipment marketing arm, for the sale of the Eastern branch of its Integrated Office Systems (IOS) division. A Northern Tele-

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▶ *NETWORK STRATEGIES*

Visa increases 'net' profit

BY JIM BROWN
New Products Editor

SAN FRANCISCO — Selling network services to drive down the cost of credit card operations, Visa U.S.A., Inc. last week contracted to carry automated clearinghouse (ACH) transactions for an association of 980 financial institutions in the Western U.S.

Visa said it signed a three-year contract with the Calwestern Automated Clearing House Association (CACHA) to process 3.5 million monthly ACH transactions for CACHA mem-

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COMMUNICATIONS CAREERS

Survey shows salaries rising

Many managers situating selves for better rewards.

PANEL OF COMMUNICATIONS USERS

BY PAUL KORZENIOWSKI
Senior Editor

Crafty communications managers are positioning themselves to take advantage of a fundamental shift in corporate organizations that will link their responsibilities closely to companies' strategic goals and enable them to command higher salaries.

"Communications salaries are ready to explode, like data processing compensation did 10 years ago," predicts Steven F. Kelley, director of telecommunications at John Hancock Mutual Life Insurance Co. in Boston. Others backed Kelley's assertion, pointing out the

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NETWORK LINE

News

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▶ Banking executives share their views on the Corporation for Open Systems' new recruitment campaign, which is targeted at their industry. Page 2.

▶ IBM's 3174 cluster controller forces competitors to scramble as it gains wide acceptance among users and drives new market growth. Page 2.

▶ Data General bolsters its networking product line and sets up a service group to help users build integrated nets. Page 2.

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▶ AT&T's special tariff for GE's private voice/data net is on hold as the FCC considers comments on net confidentiality. Page 4.

Features

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▶ Two virtual disk software systems give personal computer users access to storage on mainframe drives — without using high-overhead mainframe operating systems. Page 39.

NEWSPAPER

▶ *INTERCOMPANY NETWORKS*

EDI gives competitive edge

This is the first in a three-part series on electronic data interchange and the users of EDI networks.

BY BOB WALLACE
Senior Editor

Networks designed to automate intercompany transactions such as order entry and billing are cutting administrative costs, speeding product delivery and changing the way business does business.

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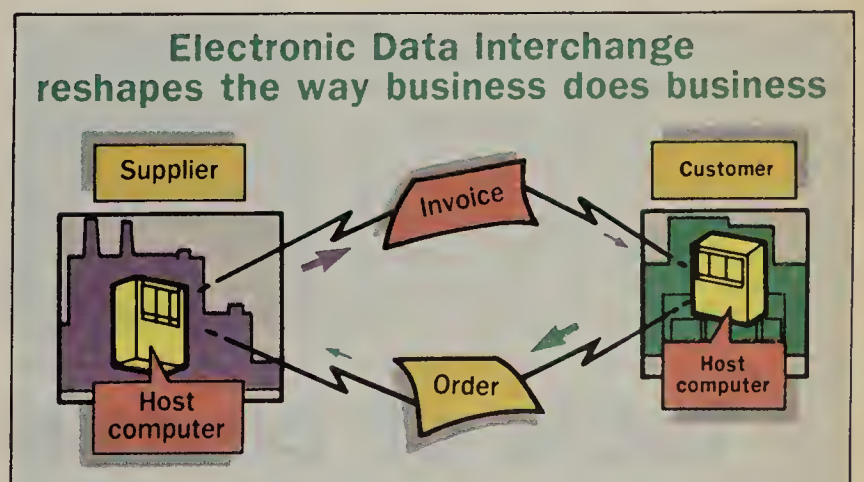

Intercompany networks directly link customers and suppliers to automate order entry and billing. This eliminates cumbersome paper transactions, cuts product delivery time, reduces inventories and speeds distribution of price changes and other time-sensitive information.

▶ *NETWORK EQUIPMENT TECHNOLOGIES*

NET augments T-1 mux line

Low-end models come with high-end features.

BY PAUL KORZENIOWSKI
Senior Editor

REDWOOD CITY, Calif. — Network Equipment Technologies, Inc. (NET) introduced a downsized member of its advanced T-1 multiplexer family last week, a move designed to extend the company's reach in the T-1 market.

The IDNX 20, the third member of NET's product line, uses the same networking software as the IDNX 40, which supports up to 15 T-1 links, and the top-of-the-line IDNX 70, which supports up to 64 T-1 lines.

Like the other multiplexers in the NET line, the IDNX 20 features dynamic alternate routing, which means the multiplexers will automatically reroute traffic around a failed node. It also features distributed network control, enabling customers to control remote nodes from a central site.

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▶ *COMDEX/SPRING '87*

Hayes unveils modems

BY PAULA MUSICH
Senior Editor

ATLANTA — Leading modem maker Hayes Microcomputer Products, Inc. introduced a new line of high-speed modems at the Comdex/Spring '87 Conference here last week, saying they provide a migration path to Integrated Services Digital Network technology.

The V-series Smartmodems product family includes two 2,400 bit/sec and two 9.6K bit/sec modems that are available standalone or as internal cards for IBM Personal Computers and compatibles. All four modems implement Link Access Protocol B (LAP B), the link-level error control protocol specified in CCITT X.25.

The new series of modems, which are compatible with existing Hayes modems, can communicate both synchronously and asynchronously. The X.25 LAP B protocol provides point-to-point error control for synchronous communications. Hayes also implemented the Asynchronous Framing Technique, which acts as an extension of the LAP B protocol for asynchronous communications.

For more on the Comdex/Spring '87 show, see pages 4, 6 and 7.

Although the company considered implementing Microcom, Inc.'s Microcom Network Protocol and Tymnet/McDonnell Douglas Network Systems Co.'s X.PC error correction protocols in the V-Series, Hayes opted for X.25 as the future error control protocol of choice.

"X.25 is the communications protocol of ISDN and dial-up packet switching," said Garry Betty, Hayes senior vice-president. "This implementation will allow us to take advantage of dial-up X.25 when it is widely available."

Other standard features of the new series include adaptive data compression, which can nearly double the throughput of the new modems, and automatic feature negotiation, which enables the modems to adjust automatically to differences in other modems.

The modems can, for example, determine the modulation used, speed of the remote device, error control used and use of data compression. They then select the combination of features that optimizes transmission efficiency.

Hayes chose to implement half-duplex communications in the series to cut costs, but the devices simulate full-duplex operation by employing a Ping-Pong-type technology to turn the communications line around quickly.

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▶ *CONTROLLER MARKET*

IBM's 3174 blossoms in features and acceptance

BY PAUL KORZENIOWSKI
Senior Editor

Nearly a year after its introduction, IBM's 3174 cluster controller is leading a resurgence in the controller market and forcing vendors of IBM-compatible controllers to scramble to maintain market share.

The 3174 garnered a lot of publicity when it was announced last June because the seven models of the controller included new features, such as support for IBM's Token-Ring Network, asynchronous communications and twisted-pair wiring. "With the 3174, IBM got its act together," noted Ilene Goldman, an analyst at Smith Barney, Harris Upham & Company, Inc. in New York.

In a recently released report, Dataquest, Inc., a market research firm in San Jose, Calif., claimed that the 3174 is driving new growth in the market for IBM and IBM-compatible controllers. The firm expects controller shipments to rise from 57,000 in 1986 to 70,000 during the current year. Dataquest said increased sales of IBM controllers will account for much of that increase, although the firm did not break down sales for the 3274 and 3174. IBM declined to comment on sales of the 3174.

Network World found a number of large companies are embracing the device because it supplies a great deal of networking flexibility. Frank Dzubeck, president of

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In the May 25 issue, the article "Spotlight on users at ICA," incorrectly identified the speaker who delivered a presentation on private branch exchange disaster recovery. Richard Simpson of NCNB Corp. in Charlotte, N.C., was the speaker.

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▶ *MULTIVENDOR NETS*

DG widens networking offerings

BY JOSH GONZE
Staff Writer

NEW YORK CITY — Data General Corp. last week introduced new communications software and hardware designed to widen the networking options for its processors. The company also announced it had set up a new service organization aimed at helping users build multivendor networks.

The product introductions, which were delivered during a press briefing here, came as part of DG's announcement of its DG/Personal Computer*Integration (DG/PC*I), which the company described as a platform of new and existing products for connecting IBM-compatible personal computers to its Eclipse MV/Family computer systems and DS/Series engineering workstations.

Among the product introductions was an IBM Network Basic I/O System- and Open Systems Interconnect-compatible interface that allows applications running on different network nodes to es-

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▶ *STANDARDS GROUPS*

Banks weigh COS pitch

BY JOSH GONZE
Staff Writer

If the Corporation for Open Systems (COS) is to succeed in its soon to be launched campaign to increase the number of users in its ranks, the standards group will have to convince users that the benefits of membership outweigh its high cost.

Top computer officials at three major banks targeted in Phase 1 of COS' new user recruitment drive told *Network World* last week they back COS' goal of promoting open system standards but agreed that the costs of COS membership are a major concern.

Banks and other financial institutions are the first users targeted in COS' recently revealed program to attract users on an industry-by-industry basis. COS will contact the chief executive officers and top computer executives at about 75 large banks by the end of June, said Ted Manakas, director of the recruitment program and information products manager for COS. Manakas said he hopes between 25 and 30 banks will join.

COS, a McLean, Va.-based group, currently has 61 members, comprising 44 vendors and 17 users. Only one bank, Citicorp, has joined so far. COS will target insurance companies next in efforts to bring more users to the membership rolls, Manakas said.

Karl Litzenberg, COS vice-president of information services, explained the group's interest in banks. "What we're trying to do is address some of the standards interests of the banking community and offer them the opportunity to come in as members," he said. "Our hope is that they would form a special banking interest group within COS."

None of the officials interviewed at The Chase Manhattan Bank, N.A., First Wisconsin Bank of Milwaukee and The Riggs National Bank of Washington, D.C. ruled out membership in the 18-month-old standards group. But they concurred that the minimum $25,000 membership fee and the need to devote employee time and effort to COS activities could keep them from joining.

The executives said the decision to join COS would ultimately rest with senior management. All three said a thumbs-up decision will de-

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▶ *COMDEX/SPRING '87*

Value-added resellers pitch user advantages

VARs offer buyers experience, service.

BY PAULA MUSICH
Senior Editor

ATLANTA — Value-added resellers that help Fortune 1,000 customers choose local networks sell their services against retailers and the direct sales forces of network vendors by claiming to save customers money while speeding net selection and implementation.

Value-added resellers interviewed by *Network World* last week at Comdex/Spring '87 here said they eliminate much of the research customers must conduct in order to select the best network for their needs. "We can answer more questions in two hours than customers can find answers for in six weeks of testing," said Tim O'Brien, vice-president of sales and marketing at The Account Data Group in Washington, D.C., a value-added reseller that provides a variety of networking services.

Although not all value-added resellers have the technical training and network experience required by Fortune 1,000 companies, qualified value-added resellers can provide years of expertise honed by research and installation of a large number of networks. This translates into savings for customers, the value-added resellers said.

"I've seen organizations study LANs from 42 vendors for two years," said Greg Boyd, vice-president of systems engineering at Columbus, Ohio-based I-LAN. "If you put a dollar value on the number of hours and resources that represents, they spent between $300,000 to $400,000 before they even took the first step. We can help shorten that analysis."

The value-added resellers also said they can help customers cut through the hype vendors relay to customers, according to Tom Henderson, president of Indianapolis-based Networks Plus.

Boyd agreed. "There's a plethora of misinformation distributed by vendors," he said. "The information they present is extremely confusing and contradictory — some of it even defies the laws of physics. We show customers what works and what doesn't work."

Henderson — who recently helped form the Local Area Network Dealers Association with Wylie Crawford, president of Chicago-based Kenwood Associates, Inc., and other Midwest value-added resellers — said the systems orientation of value-added resellers is the biggest advantage they can provide to end users. "VARs offer a complete vertical solution, from a systems design standpoint down to the guy who puts the connectors on the back of the computer.

"A VAR doing networks also has to understand the applications the customer has and needs, as well as the operating systems they're working with," Crawford said. Although value-added resellers have traditionally applied their expertise to develop vertical market applications for clients, using personal computers and peripherals as a hardware platform, many have recently added networks to that platform. In addition, a new breed of value-added reseller dedicated to local network evaluation, implementation and support has evolved and prospered. Those among this new breed are also described variously as value-added dealers and network distributors.

Compared with retailers, value-added resellers are service-oriented and employ larger support staffs, the value-added resellers claimed. "We hang in there on the tough problems, where others would walk away," O'Brien said.

Crawford said his firm can often solve customers' service problems better than the manufacturers. "In theory, a customer could get good service from the manufacturer, but that doesn't work with some vendors," he said.

Value-added resellers can also help customers avoid network downtime during the period just after installation, according to O'Brien. "If a network is installed properly in the beginning, it can run and run and run. We have pre-installation meetings to avoid any

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▶ *FCC REVIEW*

AT&T's special GE net tariff on hold

BY KARYL SCOTT
Washington, D.C. Correspondent

WASHINGTON, D.C. — The Federal Communications Commission last week deferred until July 21 approval of a special tariff filed by AT&T to provide General Electric Co. with a $400 million integrated voice/data network that will route traffic using a new, proprietary switching technology ("AT&T filing reveals guarded GE network," *NW*, May 4).

The FCC deferred its decision on the filing following opposition to it from AT&T's major competitors. In comments received by the FCC, several users groups supported the filing, but carriers raised concerns about AT&T's plan to withhold key network information.

The FCC's Tariff Analysis Division determined that it needed more time to review the complex tariff, according to R.L. Smith, a tariff analyst at the FCC who is currently working on the case.

"We didn't receive a great many comments on AT&T's [General Electric Telecommunications Network] tariff, but the issues raised by commenters warrant further exploration," Smith said.

A total of nine organizations filed comments on the GETN tariff. The Ad Hoc Telecommunications Users Committee, the American Petroleum Institute (API), Southwestern Bell Telephone Co. and GE filed in favor of AT&T's plan. MCI Communications Corp., US Sprint Communications Co., Network Equipment Technologies, Inc., Pacific Bell and Northwestern Bell filed in opposition to the GETN tariff.

One of the major points of contention is the request by AT&T that certain technical information on the network be withheld both from the FCC and from the public record.

Information termed proprietary by both AT&T and GE concerns a new switching arrangement, called Digital Tandem Switching Service (DTSS), that allows the AT&T central office switch to route traffic coming into its node to one of several different public-switched services such as Software-Defined Network, Megacom or Accunet T1.5.

"The FCC has to decide if we will ask AT&T for more information on DTSS and whether we will keep this information confidential or release it as part of the public record," Smith said.

In its filing, the Ad Hoc committee said, "Disclosure of the geographic and service configuration of GE's network could impair GE's security. Disclosure of such information is not necessary to determine the rates and regulations applicable to GE's network."

API, an organization of large petroleum companies, argued that "telecommunications networks are strategic corporate assets that provide companies with competitive advantages. Network configuration, service selection and hub locations reflect significant effort in assessing corporate requirements, capabilities and cost. Disclosure of network information can reveal corporate goals, directions and erode competitive advantages associated with innovative network design."

US Sprint contended that "despite GE's unique telecommunication needs, the services offered by AT&T consist of elemental communications functions necessary for any subscriber putting together a switched network."

For that reason, the company said, all information on GETN should be made public and all of its capabilities should be made universally available.

NETWORK WORLD
Box 9171, 375 Cochituate Road
Framingham, Mass. 01701-9171
617-879-0700

Second-class postage paid at Framingham, MA, and additional mailing offices. *Network World* (USPS 735-730) is published weekly, except for a single combined issue the last two weeks in December by CW Communications/Inc., 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171.

To apply for a free subscription, complete and sign the qualification card in this issue or write *Network World* at the address below. No subscriptions accepted without complete identification of subscriber's name, job function, company or organization. Based on information supplied, the publisher reserves the right to reject non-qualified requests. Subscriptions: 1-800-544-3712, within Pennsylvania 1-215-630-9500.

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Network World can be purchased on 35mm microfilm through University Microfilm Int., Periodical Entry Dept., 300 Zebb Road, Ann Arbor, Mich. 48106.

Network World is distributed free of charge in the U.S. and Canada only to qualified management or professionals who specify and maintain communications equipment and systems, including voice, data and video, as well as to common carriers, consultants, systems houses and manufacturers of communications equipment.

POSTMASTER: Send Change of Address to *Network World*, Box 1021, Southeastern, Pa. 19398-9979.

▶ *SYSTEM 85*

AT&T offers redundant PBX

BY MICHAEL FAHEY
Senior Writer

MORRISTOWN, N.J. — AT&T last week introduced a new version of its System 85 private branch exchange aimed at users such as hospitals and government agencies that have critical communications needs at single, medium-sized locations.

The System 85 SE, designed for customers needing 200 to 800 lines, includes a backup processor to protect against most major service interruptions.

Although the scaled-down version of AT&T's top-of-the-line PBX will compete head-to-head with the System 75, the smaller System 75 cannot support a redundant processor.

An AT&T spokeswoman said the System 85 SE is targeted to users that require extremely reliable communications systems.

"We wanted to respond quickly to that niche market and took an existing technology — the System 85 — and adapted it to appeal to that market," the spokeswoman said.

The System 85 SE can be used as an end point in an Electronic Tandem Network but cannot be used as a full-function network node unless outfitted with Distributed Communications System software, according to the AT&T spokeswoman.

An AT&T spokeswoman said the System 85 SE is targeted to users that require extremely reliable communications systems.

"We wanted to respond quickly to that niche market and took an existing technology — the System 85 — and adapted it to appeal to that market."

The product includes all voice and data features available on System 85 models (Release 2, Version 3), such as automatic route selection and support of the AT&T Digital Multiplexed Interface, which provides a PBX interface for computer connectivity.

According to the AT&T spokeswoman, the company will offer the new product at a price 10% to 15% lower than a similar System 85 with complete private networking capabilities.

Carlos Santiago, president of Harbinger Group, Inc., a Norwalk, Conn.-based consulting company specializing in office automation and telecommunications management, said the redundancy provided by the System 85 SE's second processor offers only a slight increase in reliability over the System 75.

The smaller switch, Santiago said, has a reputation for being very reliable.

Santiago added that the System 75 is much easier to administer than the larger System 85. "You can teach someone how to manage the System 75, in terms of making moves and changes, in a few hours," Santiago said. "The System 85 is much harder to operate."

Will Felling, vice-president and director of the telecommunications group at Dataquest, Inc., a San Jose, Calif., market research company, described the introduction of the System 85 SE as "a smart move that leverages R&D work that was done earlier and reuses it in an application requiring redundancy."

For users, the System 85 SE offers a switch with a redundant processor at a price lower than the System 85, Felling said.

TARIFF TOPICS

AT&T seeks mux service approval

BY KARYL SCOTT
Washington, D.C. Correspondent

WASHINGTON, D.C. — AT&T recently filed a tariff for a service function called Network Multiplexing Arrangement that enables up to 20 2,400 bit/sec analog circuits to be packed into a single 56K bit/sec Dataphone Digital Service (DDS) line.

The tariff was filed with the Federal Communications Commission to meet one customer's needs, but the service could be made generally available if demand develops, according to AT&T spokesman James Byrnes.

If the tariff is approved, AT&T will set up a central office switch to act as a hub for analog circuits used by an unnamed transportation company to support remote terminals and aggregate this traffic over a single 56K bit/sec DDS line back to a central site. The switch will perform the analog-to-digital conversion.

Although a desirable service, it is not expected to attract many customers because of the $500 installation charge and $6,000 monthly service fee, according to tariff analyst Robert Ellis of The Aries Group, Inc. in Rockville, Md.

"The concept of multiplexing a 56K bit/sec line down into slower speed channels for data transmission is a good idea. Many of my clients have asked AT&T for it," Ellis said. "It now looks like they're doing it for a single client, but the cost doesn't make sense," he added.

> "Multiplexing a 56K bit/sec line down into slower speed channels for data transmission is a good idea. Many of my clients have asked AT&T for it," Robert Ellis said.

Many of the regional Bell holding companies have offered similar central office-based multiplexing functions under tariff since April 1985. Bell Atlantic Corp., for example, charges about $256 per month for multiplexing a 56K bit/sec line down into 20 2,400 bit/sec lines, according to the tariff.

For T-1 multiplexing functions, which break the circuit down into 24 voice channels, AT&T charges only about $412 per month, even though T-1 lines are about five times the cost of 56K bit/sec DDS circuits.

This type of offering may, however, be desirable for small- and medium-volume communications users who do not have the large volume necessary to justify the cost of a T-1 circuit.

Many customers would rather let AT&T perform the multiplexing function at its central office switch, rather than invest in a multiplexer and hire personnel to maintain the equipment, Ellis said.

"If AT&T could get the monthly charge down to around $350 per month, I think a lot of customers would be interested in it. But I don't know if AT&T is willing to do that," Ellis said.

The new multiplexing arrangement is expected to produce $72,500 in revenue for AT&T in 1987.

The tariff is scheduled to take effect July 12, pending FCC review.

HIGH-SPEED COMMUNICATIONS

DEC, Cray join forces

VAX Supercomputer Gateway to come.

BY JIM BROWN
New Products Editor

NEW YORK — Digital Equipment Corp. announced an alliance with Cray Research, Inc. here last week to develop a gateway that will allow a VAX 8250 minicomputer to act as a front-end processor for Cray supercomputers.

The VAX Supercomputer Gateway will enable VAX processors and workstations in a DECnet environment to submit batch jobs to the Cray supercomputers and help DEC stave off customer migration to departmental supercomputer vendors such as Floating Point Systems, Inc.

The VAX Supercomputer Gateway, supported by Cray Station software, will provide a direct asynchronous link between the VAXBI bus and the memory I/O subsystem of Cray-1, Cray X-MP and Cray-2 supercomputers. The link, which requires Cray-supplied wiring, will operate at IBM host-processor channel speeds of 24M bit/sec at distances up to 50 ft.

In addition to jointly developing the VAX Supercomputer Gateway, the two firms announced they would jointly develop and market applications that use the link.

Those products will be aimed at scientists and engineers involved in molecular modeling, finite element analysis, computational fluid dynamics, complex seismic and geological modeling and very large scale integration (VLSI) circuit design. The products will also be aimed at the business sector seeking applications for econometric and financial modeling.

Acting as a front end to a supercomputer, the VAX prepares data for the vector-type processing done by the Cray. The VAX will do some processing and interact with the Cray for computationally intensive operations.

With the gateway, applications running on a VAX can be programmed to submit batch files automatically for processing on the Cray. The gateway will convert data to a format understood by the Cray, transmit the data directly to the Cray's memory and await an answer. Then the gateway would route the answer to the application that requested the process.

The VAX Supercomputer Gateway will support connections between Cray equipment and VAX Clusters, which can comprise up to 16 VAX processors that interoperate as if they were one unit, and DECnet local networks. These connections enable VAX minicomputers as well as VAX workstations to submit batch jobs to the Cray.

Prices for the gateway start at $180,000.

Cray, which sells systems for between $5 million and $15 million, has an installed base of about 150 systems. According to John Logan, a senior analyst with the Boston-based Yankee Group, 50% of these processors are configured with IBM mainframes as front ends, while 20% of them have DEC VAXes as front ends. Control Data Corp. processors are also used as front ends for Crays.

Processors can be connected to Cray systems using products such as Network Systems Corp.'s Hyperchannel, which links computer systems over channel-to-channel communications. That method, however, supports mostly bulk data file transfer, whereas DEC's new gateway links the memory of the VAX to the memory subsystem of the Cray.

Logan says IBM sells a vector-processing facility for about $325,000. That system is used in conjunction with an IBM 3090 mainframe. With the announcement, Logan said, DEC will stress it has matched IBM's channel-to-channel transfer speeds and can offer users better functionality than the IBM front-end systems at a lower cost.

Unless IBM and Cray announce a similar relationship, the joint DEC and Cray announcement may hurt IBM. "If you have a list of function preferences that you'd like to have, DEC has another check in the box. IBM does not. That could disappear in a year. What remains is DEC's general advantage of better networking with DECnet vs. IBM's System Network Architecture," said Don Brown, principal of D.H. Brown Associates, Inc. of Tarrytown, N.Y.

COMDEX/SPRING '87

Novell, CXI bolster LAN links

Bridge, gateway products debut.

BY MARY PETROSKY
West Coast Correspondent

ATLANTA — Novell, Inc. broadly expanded the connections between its local-area networks and both asynchronous and IBM host environments last week with the rollout of a series of bridge and gateway products.

The announcements were made at the Comdex/Spring '87 Conference here in conjunction with CXI, Inc., a company Novell acquired in January.

Novell's software-based remote asynchronous bridge can be used to connect NetWare-based local-area networks or it can provide remote personal computers access to a NetWare network.

The bridge comes in a single-line version, which uses the existing asynchronous port on an IBM Personal Computer or compatible, and a multiline version, which requires an add-on board with four ports.

The bridge, which supports transmission speeds up to 19.2K bit/sec, automatically establishes links to other networks after determining the address of network data. The single communications line bridge costs $395, and the multiline version costs $995.

The company's new NetWare Asynchronous Connection Service enables users on a NetWare-based network to access asynchronous minicomputers, as well as information services such as The Source. Connections to hosts can be either direct or remote.

Unlike Novell's earlier product, which allowed a user to connect to only one asynchronous gateway, NetWare Asynchronous Connection Service lets users connect to any gateway by resource name.

The product, priced at $1,095, supports up to nine concurrent sessions and is designed to be used in individual personal computers on the network, and not in a dedicated gateway.

Both Novell products are due in the third quarter.

CXI unveilings

For its part, CXI unveiled a series of remote and direct-connect 3270-emulation gateways for Novell networks. Both types of gateways support IBM's Network Basic I/O System, as well as a proprietary Novell protocol called the NetWare SPX LAN interface. SPX supports internetworking; NETBIOS does not.

The new PCOX/COAX-MUX is a coaxial cable gateway board that enables networked IBM Personal Computers and new Personal Sys-

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▶ *COMDEX '87*

DCA micro links debut

BY MARY PETROSKY
West Coast Correspondent

ATLANTA — Digital Communications Associates, Inc. (DCA) used the Comdex/Spring '87 show here last week to introduce an IBM terminal-emulation product for Apple Computer, Inc.'s newest microcomputers and a link between IBM System/3X minicomputers and IBM's new Personal System/2 microcomputers.

MacIrma, a terminal-emulation board for the Macintosh II and Macintosh SE, is the first Apple micro-to-mainframe product from DCA, manufacturer of the popular Irma 3270 emulation board for IBM Personal Computers.

MacIrma enables both Macintosh microcomputers to emulate IBM 3278 or 3279 terminals and perform file transfers. When used in conjunction with a host software component — DCA's Irmalink or ForteNet, or IBM's 3270 File Transfer program — customers can use the typical Macintosh cut-and-paste commands to access parts of host files.

MacIrma is the first Apple micro-to-mainframe product from DCA.

Priced at $1,195, MacIrma will be available in the fall.

DCA also announced a new version of Smart Alec 5250/90: hardware and software that provides terminal emulation and bidirectional file transfer between Personal Computers and IBM's family of System/3X minicomputers. The new version also enables System/3X processors to support IBM's new Personal System/2 Model 50, 60 and 80 microcomputers and is said to have the same functionality and user interface as earlier versions of this product.

The new version of Smart Alec is slated for release in the third quarter and is priced at $895.

The Alpharetta, Ga.-based company also introduced Irma 2, software that enables users of IBM Personal Computers to move from Control Unit Terminal Emulation to Distributed Function Terminal (DFT) technology.

With DFT technology, users of Irma 2 will be able to take advantage of multiple sessions and All Points Addressable graphics. Irma 2 is being offered as a complete product, including add-on board, and as a software upgrade for users with existing Irma and Forte PJ hardware.

Irma 2 will be available this month. Pricing for the full Irma 2 is $1,195; the software can be purchased separately for $395. From now until Dec. 31, 1987, current Irma and Forte PJ users can upgrade to the software for $75.

Personal Computers equipped with Irma products can also take advantage of another new product announced at the show, Windowlink for Irma, which allows DCA's terminal-emulation and file-transfer software to run under Microsoft Corp.'s Windows application.

Windowlink is a software module that works in conjunction with Irma 2, Irma or Forte PJ to allow terminal emulation and micro-to-mainframe file transfer to run as Microsoft Windows applications. Windowlink features include background file transfer and cut, copy and paste capabilities.

Since Windows allows users to have multiple active applications at one time, both a host-emulation session and file transfer remain active while Windowlink users switch to another application, such as word processing.

Due for delivery in early fall, Windowlink is priced at $195.

VARs pitch user advantages

continued from page 4

surprises. By using this, we can control the variables to avoid service problems later on."

Crawford, like many of his counterparts, avoids problems by installing and testing a customer's network at his firms' facilities before installing the equipment at the customer's site.

All of the hand-holding comes at a price that is steeper than what customers would pay through a retailer or direct sales representative. Although billing at each firm is different, Henderson from Networks Plus admitted, "We tend to be rather profitable."

But Boyd maintained that by getting customers to consider the life cycle costs of the system, including the cost of using the system, value-added resellers can help customers find ways to keep those costs down.

Crawford said problems users might be unaware of are endless. "Customers tend to make a lot of wrong assumptions about what their needs are," he said.

▶ *OPEN NETWORKING*

Sun extends reach to IBM with new net gear

BY PAM POWERS
Senior Editor

SANTA CLARA, Calif. — Expanding on its Open Systems Network (OSN) strategy, Sun Microsystems, Inc. last week announced products designed to provide greater compatibility with IBM, including software that will enable applications on Sun systems to communicate via LU 6.2 with IBM System/36s, 38s and IBM Personal Computers.

Products released as part of SunLink Version 5.0 included the SunLink Channel Adapter, an IBM mainframe channel adapter that provides a programmable, high-speed local connection to IBM and IBM-compatible mainframes.

The $20,000 adapter, consisting of two VME-compatible boards, enables Sun devices outfitted with the proper software to emulate a number of host-attached devices simultaneously, Sun reported. In some configurations, the adapter will eliminate the need for multiple devices performing control unit emulation.

The new SunLink Local 3270 is a software product that enables Sun workstations to emulate locally attached IBM 3274 cluster controllers. Sun workstations connected to the gateway by Ethernet can now perform 3278 terminal emulation, 3270 PC file transfer and Datastream Access Interface to 3270 datastreams at channel speeds. Local 3270 is priced at $6,000.

LU 6.2 compatibility is provided through SunLink SNA Peer-to-Peer, a software package that enables Sun systems to communicate using IBM's Advanced Program-to-Program Communications and Document Interchange Architecture (DIA) command function sets. These products enable devices to communicate within an IBM Systems Network Architecture environment on a peer basis.

Using IBM's APPC application programming interface, software developers can create applications on Sun Systems that can communicate via LU 6.2 protocols with IBM System/36s, System/38s and Personal Computers. Support of IBM's DIA will also enable Sun systems to communicate with other DIA-compatible products, such as IBM's DISOSS.

The product will sell for $6,000.

Also announced was the SunLink Multiprotocol Communications Processor, a $4,000 add-on board that has two RS-232-C/RS-423 ports and two RS-449 ports. Each board supports synchronous and asynchronous transmission and can support several protocols simultaneously, including SunLink SNA 3270, X.25 and Defense Data Network protocols.

As part of the OSN strategy, the spokeswoman said Sun will develop a new product that will combine the technologies of its Network File System (NFS) — a remote file access protocol — with Centram Systems West, Inc.'s Transcendental Operating System (TOPS) local network software. Centram is a wholly owned subsidiary of Sun.

The TOPS software allows for file sharing between Apple Computer, Inc. Macintoshes and IBM Personal Computers and compatibles. The product combinig NFS with TOPS is scheduled for availability by third quarter 1987.

Washington Update

BY KARYL SCOTT
Washington, D.C. Correspondent

WASHINGTON, D.C. — In an effort to meet user demand for more stable access rates, US West, Inc. last week sought Federal Communications Commission permission to establish unified access rates for its 14-state operating territory.

US West now has more than 6,400 different rates for access services throughout its region. Rather than having separate rates for each service in each state, US West would have one regional rate for each access service offered in the US West operating territory — reducing the total number of tariffs to 425. These rates would be arrived at by averaging rates for each service, according to the tariff filed by US West.

US West and all other local telephone operating companies provide access between customer premises and the networks of long-distance carriers.

Under a unified rate plan, long-distance carriers and private network customers who use US West's access services will be better able to predict rates and plan their budgets, according to US West. Long-distance carriers will also be better able to price their services because their costs for local access will not vary from state to state.

With rate averaging, a cost change may not necessarily result in a rate change, said Judith Nitsche, tariff analyst with the FCC Tariff Analysis division, because the cost is spread out over a wider customer base.

Under the rate averaging scenario, some rates will increase and others will decline, according to Nitsche. A customer in a state with lower rates than surrounding states will probably see rates increase.

The regional Bell holding company claimed this type of rate averaging would protect customers from the constant rate changes that now occur on a state-by-state basis.

US West said billing procedures will be simplified, and this will make it easier for customers to monitor their bills.

US West will not earn any additional revenue under this new method of rate making. "Rate averaging shouldn't give US West any economic advantage," said Nitsche, who added that the FCC doesn't see any potential problems with this rate-averaging plan, although she acknowledged public comments on the plan may indicate otherwise.

The Texas state legislature last week passed a compromise deregulation bill for long-distance carriers that will allow the dominant carrier, in this case AT&T, more flexibility in setting rates for interexchange services deemed competitive by the state public utilities commission. If signed into law by the governor, the bill will take effect in 1989. The law will permit AT&T to change rates within predetermined price bands and to introduce new rates on short notice.

▶ *POINT-OF-SALE NETWORKS*

US West unit wins $30m net deal

BY KARYL SCOTT
Washington, D.C. Correspondent

OMAHA, Neb. — Applied Communications, Inc., a subsidiary of US West Information Systems, last week announced the signing of a five-year, $30 million contract to provide the Australia and New Zealand Banking Group Ltd. with a point-of-sale network that will link 60,000 terminals throughout Australia.

This is the largest contract Applied Communications, based here, has won to date, according to the company, and it is seen as a coup for parent US West in its attempt to diversify beyond the local exchange market.

Applied Communications markets transaction processing software and services for automated teller machine, point-of-sale terminal, manned teller machine, videotex, home banking, wire transfer and cash management networks. Applied Communications' Base24 and WireNet software products are licensed to 180 customers worldwide.

Applied Communications will serve as systems integrator for the Australian POS network, installing hardware and software and handling support for the net, which will process more than 180 transactions per second.

Under the Australia and New Zealand contract, Applied Communications will deliver its Base24-atm and Base24-pos products, in addition to Tandem Computers, Inc. hardware provided under a remarketing agreement. The initial hardware configuration will include Tandem high-end NonStop VLX processors and POS terminals manufactured by a variety of vendors.

Under Phase 1 of the project, four to eight Tandem CPUs will be brought on line and 6,000 to 12,000 POS terminals will begin operation in October 1987, said Dale Ratliff, director of international support at Applied Communications. The Tandem CPUs will process the transactions, which will be entered at store locations.

The Australia and New Zealand network will run over Australian Telecom's Tran$end X.25 public packet network.

Tran$end is a new network now in pilot tests and will be on line by the time the Australia and New Zealand network comes on line, Ratliff said.

Australia and New Zealand's POS network will also interconnect with a variety of hosts and private networks run by other banks and credit authorization companies. "In order to process many transactions, we will have to communicate with a number of host systems and networks outside of the Australia and New Zealand network," Ratliff said. "Our software supports many of the most commonly used systems in the banking community such as IBM, Wang, NCR and Unisys.

"The Australia and New Zealand network will be required to switch transactions onto private networks, and our support of the Telecom/EFTPOS X.25 protocol standard will ensure successful communications," Ratliff said.

Derek Gall, general manager of Australia and New Zealand Electronic Network Services, said, "We believe that the Tandem architecture, combined with the software experience of Applied Communications, provides us with the capability to expand our systems in a rapidly changing technical environment as quickly as the market demands."

Applied Communications, which was acquired by US West in July 1986, plans to open an Australian sales office this year to increase its customer base from the six accounts it currently has in the Australian banking market.

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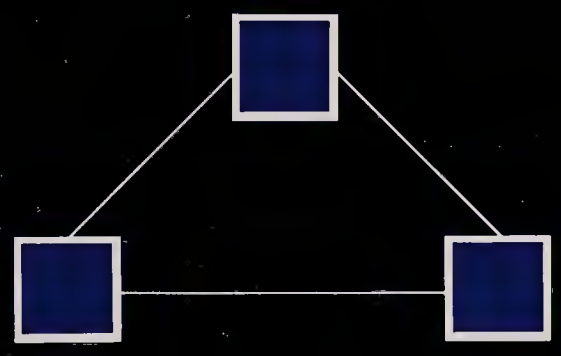

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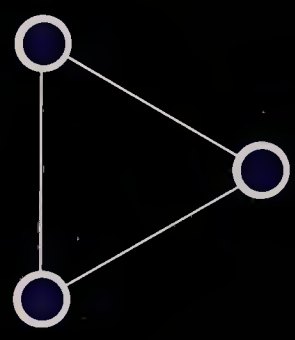

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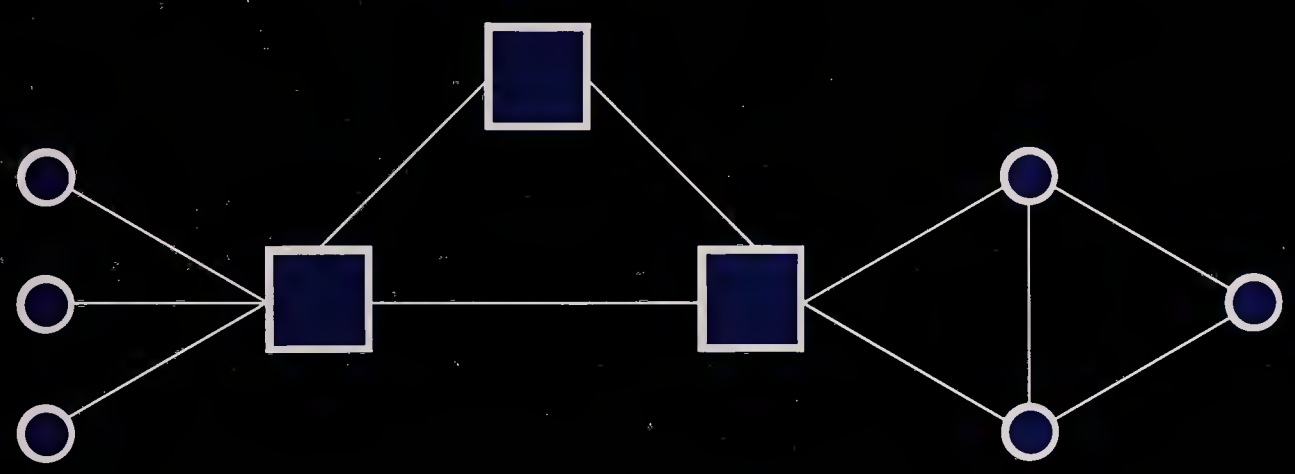

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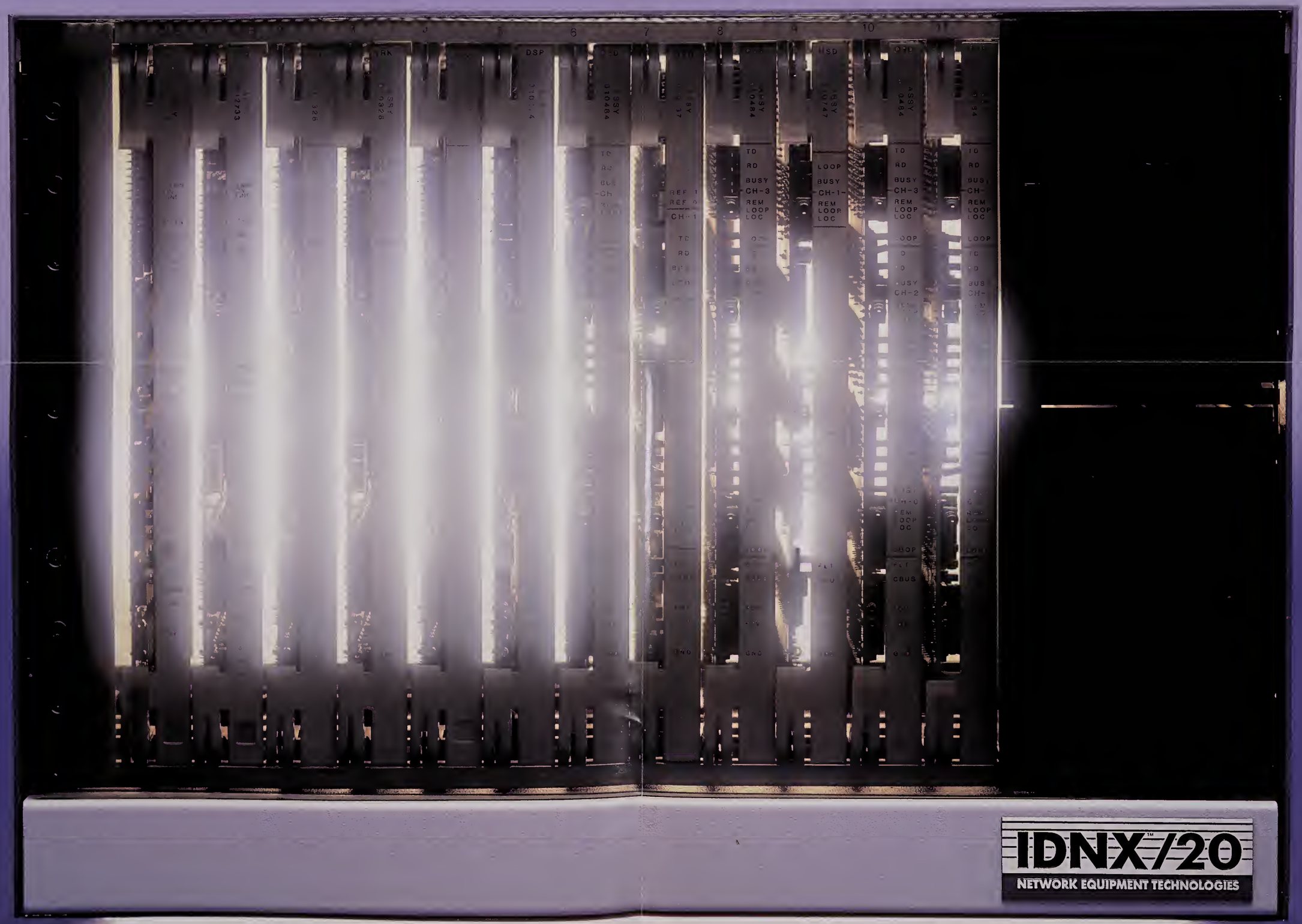

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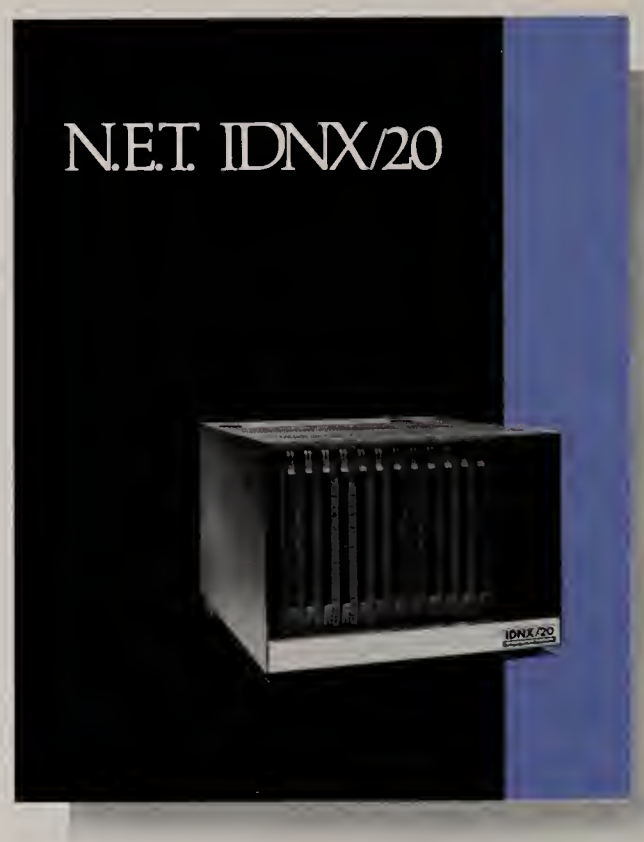

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INDUSTRY UPDATE

AT&T president addresses U.S. economy

AT&T President Robert E. Allen recently spoke out against deficit spending and the declining state of the American economy. Allen said he is concerned that "we are spending more than we are producing," a situation that could be partially rectified if the U.S. exploits its leadership position in information technology. "Our best bet for enhanced productivity lies in our communications technology," he said, but American business has failed to commit to it. "The plant and the office suffer from lack of connectivity, networking and compatibility."

VENDOR VIEW

CHRIS KENBER

The potential of digitized voice

While T-1 networking has unquestionably become the hottest topic in wide-area networking today, a new development is beginning to focus attention on the T-1-like capabilities of 56K bit/sec and lower speed digital links for a wider range of users.

T-1 has brought digital voice and data integration into large corporate networks and given some of the nation's largest organizations a degree of control over their communications that was reserved for carriers in the past.

However, the benefits of this networking approach are about to become available to a far greater audience, thanks to advances in the digitizing of voice. As a consequence of new techniques in low bit-rate voice-digitizing methods, users will soon be able to create integrated voice and data networks over 56K bit/sec digital data links and combine statistically multiplexed voice and data over 19.2K and 14.4K bit/sec leased lines.

The secret lies in the ability to digitize voice to operate at 9.6K bit/sec, while retaining communications-quality voice reproduction. For some years, digitized voice has been available at rates below the 64K bit/sec pulse code modulation (PCM) standard and 32K bit/sec adaptive differential PCM techniques used today, but the techniques have only provided a "Speak and Spell" sound quality that eliminates speaker recognition and emotional content from conversations. Now the market is beginning to see demonstrations of 9.6K or 14.4K bit/sec digitized voice that provides full speaker recognition and carries the full emotional content of the conversation.

A single 56K bit/sec DDS link may eventually be able to carry as many as 12 voice channels or 12 channels of mixed voice and data at better than acceptable voice quality. At 14.4K bit/sec, it will be entirely feasible to carry multiple voice and data channels, bringing voice and data integration within the reach of even the smallest location.

This development is dramatic by itself because of its potential to expand the capacity of existing T-1 links greatly. But when combined with statistical multiplexing of data, it offers broad integrated voice/data networking to the whole spectrum of small and medium-sized users for whom the expense and complexity of T-1 links have been impractical.

Many locations with significant transaction processing needs, such as bank branches and retailers, could make immediate use of wide-area 56K bit/sec integrated voice/data networks in volumes that could dwarf the T-1 marketplace, particularly with the higher reliability and tariff reductions of digital services. This new voice technology also operates effectively over satellite links, despite the built-in delays — in fact, Micom uses its own low bit-rate voice technology to communicate to its Puerto Rico facility over a satellite link, with no discernible reduction in voice quality.

New technologies frequently fail to live up to their advance billing. Nevertheless, low bit-rate voice has the potential to change the landscape of integrated voice/data networking and to multiply the current T-1-oriented market opportunity many times over.

Kenber is corporate vice-president, marketing operations, with Micom Systems, Inc.

Q&A

NATA chief outlines views on industry

Now in the second half of his one-year term as the president of the North American Telecommunications Association (NATA), Edwin Spievack has adapted NATA to suit the changing needs of its members, the interconnects. Senior Editor Pam Powers discussed with Spievack NATA's emerging role as educator for the interconnects, which are trying to diversify into new lines of business following the recent decline in the private branch exchange market and increased competition from the deregulated Bell operating companies.

How large is NATA?

We currently have about 700 members, which doesn't represent much expansion for the past year, but it's good considering the recent shakeout in the interconnect industry. In the past year and a half, a large number of our members have exited the market.

What were the causes of the shakeout?

As the regional Bell operating companies came back into the market, there was a real squeeze on profitability for the interconnects. They simply lacked the economic resources to sustain themselves against the competition.

Also, manufacturers have of late tried to respond to price wars by establishing exclusive distributorships in order to limit competition. In the past, any distributor who wanted to go into business had access to the products of virtually any manufacturer. That's no longer the case.

Finally, Centrex has had and will continue to have a significant impact on the

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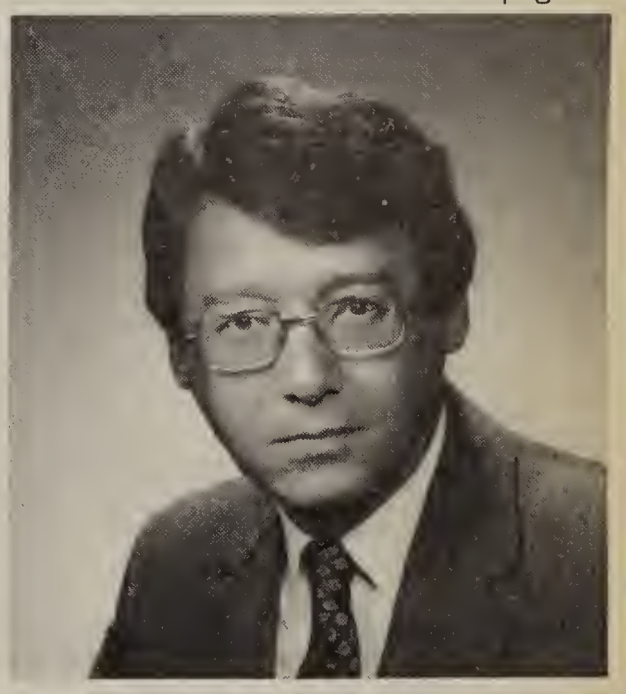


Edwin Spievack

SATELLITE NETWORKS

Equatorial wins VSAT deal

BY KARYL SCOTT
Washington, D.C. Correspondent

MOUNTAIN VIEW, Calif. — Equatorial Communications Co. recently signed a $4 million, two-year contract with S&L Data Corporation, Inc. of Cincinnati for a VSAT satellite network to support customers of its financial services operations in 15 states.

S&L provides data base management and computer communications to the 200 financial institutions that own S&L. The satellite system of very small aperture terminals will be used to supply these institutions with communications and access to S&L's on-line transaction processing facilities.

The S&L equipment and service contract, combined with other recent orders totaling more than $10.5 million, comes as good news to the financially troubled Equatorial, which reported a $3.31 million loss for the first quarter of this year. Equatorial revenue dropped 37% from $18.8 million for the first quarter of 1986 to $11.9 million for the corresponding period this year.

Customers who recently signed contracts for Equatorial VSAT networks include Reuters Holdings plc of the UK; Cable & Wireless, Hong Kong; the U.S. Forest Service; the U.S. Bureau of Land Management; the government of India; and Fiserv, Inc.

Under the S&L contract, Equatorial will provide: its EquaStar satellite transaction network, which includes an undisclosed number of C-200 microcomputer earth stations; access to Equatorial's master earth station and packet-switching equipment in Mountain View, Calif.; C-band frequency transmission over Equatorial-owned satellite capacity; and 24-hour-a-day network operation and maintenance.

"We considered a variety of technologies before deciding on the VSAT network," said Gary Ferguson, assistant vice-president for planning and product development at S&L, but the deciding factor was Equatorial's support of the Burroughs Corp. poll select protocol. "We, like many financial institutions, are heavy users of Burroughs computers and needed a network that would support the

See page 10

BRIEFS

Martin Marietta Corp. recently entered into an exclusive agreement with **RCA American Communications, Inc. (AMERICOM)** under which AMERICOM will provide wideband video transmission services as part of the Martin Marietta team bid on Federal Telecommunications System 2000.

M/A-Com Telecommunications, Inc. said it signed a contract with **Edward D. Jones and Co.,** an investment counseling firm, for the provision of a pilot very small aperture terminal network.

Beginning in the second quarter, M/A-Com will connect 11 Jones branch office sites to the M/A-Com satellite hub in Germantown, Md. Jones will use the VSAT network for digital data, voice and video applications. M/A-Com Telecommunications was recently acquired by Hughes Aircraft Co.

Arthur Young & Co. hosted a San Francisco Bay Area Entrepreneurs of the Year contest. Among its winners was **Excelan, Inc.'s** executive vice-president for business development, Kanwal Rekhi, who took the award for entrepreneurial success of a business owned and operated by a minority individual. Under Rekhi, Excelan doubled its revenue between 1985 and 1986.

Ericsson Information Systems, Inc. was recently awarded two contracts for the provision of Ericsson's Axe central office equipment to **Southwestern Bell Corp.**

The contracts are for early 1988 installation of equipment for use in a Missouri central office serving 15,000 subscribers and for switches for Southwestern's technology facility, to be up by mid-1988.

Northern Telecom, Inc. has installed a $1 million DMS-250C digital communications system for a Hawaiian long-distance reseller, Long/Distance USA.

The company will use the system primarily for the provision of operator assistance services to some 40 hotels in the Hawaiian islands.

General DataComm, Inc. announced a reorganization under which a strategic development unit will be formed to develop "networking concepts," and the company's international operations will be combined into a single unit.

James E. Linnel, former vice-president of international operations, was elected as the new vice-president for the strategic operations unit.

Added to the list of recent management changes within **Corvus Systems, Inc.** is William R. Halford as vice-president, reporting to Joseph W. Rooney, executive vice-president. Halford was a sales manager with Rolm Corp.

Artel Communications Corp. posted a first-quarter loss of $927,186 on revenue of $802,734. That compares with a net loss of $342,103 for the first quarter of last year on revenue of $1.068 million. The fiber-optic system vendor said recent management changes are expected to improve the company's earnings performance.

CompuServe, Inc. said it will reduce connect rates for its Information Service to equal its current evening and weekend connect rates, starting June 1.

In the past year, CompuServe has reduced rates for its 2,400 baud access and free upload services.

Equatorial wins deal

continued from page 9

Burroughs protocol."

Another important factor in choosing Equatorial was the fixed-rate contract. "We found we were becoming far too dependent upon AT&T," Ferguson said. "We didn't want to be tied to one vendor. We suffered some major price hikes when AT&T increased its private-line rates. We went with Equatorial to get some rate stability for a few years," Ferguson said.

S&L estimates that most of its 200 offices and member savings institutions will use the network, which will be operational by the end of this year, Ferguson said. Network users can either purchase or lease the VSAT equipment from S&L.

A few weeks prior to the S&L announcement, Equatorial revealed details of its deal with Reuters, the British news wire service. Equatorial will provide Reuters with a master earth station in New York and 250 C-100 VSATs to provide its news service to subscribers in Central America, South America and the Caribbean.

The one-way broadcast data service will use the International Telecommunications Satellite Organization Intelnet 1 data transmission service. An identical service is being used by Reuters to provide news service in the U.S.

NATA chief

continued from page 9

unit and dollar volume of private branch exchange sales.

What has been the result of the shakeout?

The merger and acquisition movement has been the primary result. Two years ago, companies were acquiring and merging on a willy-nilly basis. That, unfortunately, resulted in a number of new companies with too diverse a range of products and services.

Last year, these companies became more sophisticated. Now mergers are concentrated within precise regional and local areas, with limited product lines. That way, after the acquisition, they don't face the necessity of further capital investment in training people to maintain, sell and install diverse product lines that they don't understand.

There is no question the shakeout has created stronger companies, for the most part, and has eliminated a lot of confusion for the user.

What does the future of the interconnect industry look like?

The whole telecommunications economy is moving more and more toward networking services, particularly integrated voice and data, and ultimately to software applications through the network.

> There is no question the shakeout has created stronger companies, for the most part, and has eliminated a lot of confusion for the user.

Networking is the wave of future.

The question is: Who will be at the leading edge of that movement, the computer or the telecommunications industry? That has been resolved in Europe, where the telecommunications industry has sat passively behind, letting its resources be used as substructures for computers. The issue is not resolved at all in the U.S. and won't be for some years yet.

How has NATA's role changed with the changes in the industry?

Our legal/regulatory role is declining as our service role is increasing. Now we are more often structuring new relationships for the interconnects. We're trying to reposition them in data and computer products, software applications, and new distributor arrangements. We are getting them more involved in commissionable sales of network services and educating them to innovatively configure networks for customer utilization and office automation applications.

Do you think the FCC has done the right things to ensure competition in the industry?

I think the FCC has gone as far as it can go with deregulation. The commission realized, with the elimination of the separate subsidiary rule, that it was placing the BOCs in a position to reassert their monopoly control through dominance of the local exchange. So the commission developed a series of nonstructural safeguards.

> Congress is frustrated because we conduct a free market economy while every other nation conducts a mercantilist policy with respect to international trade.

The most significant of those is that the agency allows independent vendors to sell the same bundle of network services a BOC can sell. This means any vendor can form a business and use the backbone network in any creative way to sell network services. Part of our role is to educate the interconnects to provide such services.

These developments are having a significant impact in terms of the potential BOC bottleneck. With such competition, the BOCs will no longer have monopoly power.

You have spoken out about the international trade situation. What are your thoughts?

Congress is frustrated because we conduct a free market economy while every other nation conducts a mercantilist policy with respect to international trade. The competition is unbalanced.

But I don't think fighting with the president will lead to any change in the trade situation. Most American businesses don't even want to participate in international trade. They don't want to live up to the enormous financial commitments, and they don't have the talent to do it. It's a very bad situation.

TELECOM TRENDS

"I have a staff of three. The third guy has a divinity degree. If the other two can't fix the PBX, the third one can say a prayer for the switch or one for the people who operate it.
Ken Conley
Telecommunications manager
Monsanto Co.
St. Louis

CALL ACCOUNTING

Mitel, Summa Four call system bows

Lets older PBXs, key systems track and control calling costs.

HERNDON, Va. — Mitel Datacom, Inc. and Summa Four, Inc. recently introduced a call accounting system designed to enable users of older private branch exchanges and key telephone systems to track and control long-distance calling costs.

The call accounting system combines a Mitel Datacom Call Line Identifier with a call accounting system provided by Summa Four. The system, available immediately, can be purchased from a nationwide network of dealers and distributors for both companies.

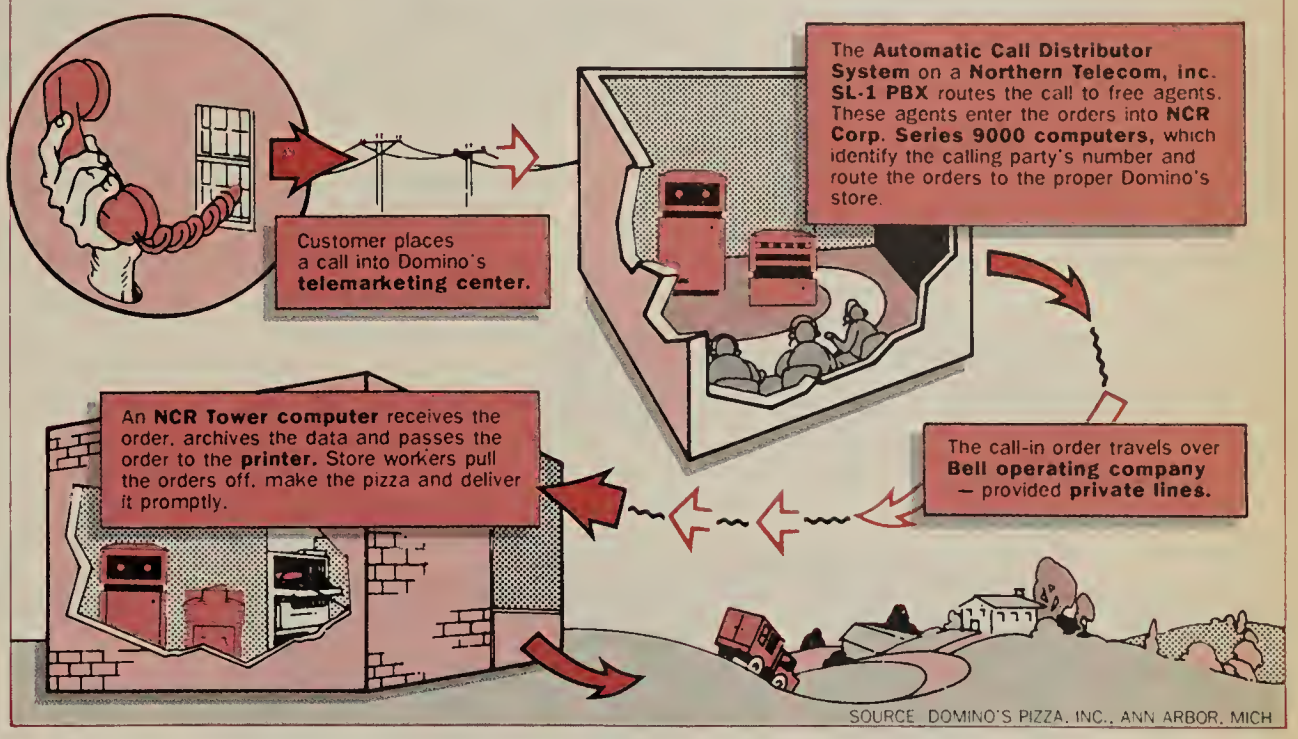
The Mitel Datacom portion of the package consists of a Call Line Identifier (CLI) and a SMarT-1 Programmable Communications Controller. The CLI hooks to every telephone station and feeds data to the communications controller. The controller is hooked to the Summa Four call accounting system via an RS-232 link. The vendor said The CLI unit can be used with any vendor's PBX.

The vendor said the Mitel Datacom CLI system is designed for use by hotels and motels that do not have systems that allow them to bill call costs to their guests.

Mitel Datacom, a subsidiary of PBX maker Mitel Corp., said three other Summa Four call accounting systems will work with its new package. They are: the MCX 7700 Plus, the PCX 3700 hotel system and the Personal Computer-based Costar.

For a four-trunk, 25-line switch, the Mitel Datacom CLI system costs less than $1,100. Pricing for Summa Four's MCX 7700 Plus ranges from $1,995 to $3,995; the PCX 3700 costs $5,495; and the Costar retails for between $1,995 and $2,995.

Domino's Pizza, Inc.'s new phone-in ordering system



SOURCE: DOMINO'S PIZZA, INC., ANN ARBOR, MICH.

PIZZA DISTRIBUTION

Domino's ACD net to aid quick delivery

BY BOB WALLACE
Senior Editor

ANN ARBOR, Mich. — Hoping to grab a bigger slice of the pizza sales pie, Domino's Pizza, Inc., began constructing a nationwide ordering network late last year that will feature a series of regional telemarketing centers equipped with Northern Telecom, Inc. automatic call distributors (ACD).

The $1.7 billion, 3,800-unit pizza store chain plans to improve customer service

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CROSS TALK
BOB WALLACE

Uncertain future hurts Rolm

Uncertainty about IBM's plans for Rolm Corp. have confused some Rolm PBX users and dissuaded other prospective users from purchasing Rolm telecommunications equipment.

Prior to the recent National Rolm Users Group (NRUG) meeting in New Orleans, NRUG President Charles Garrison and Treasurer Frank Schoff said they were unsure of Rolm's direction. Ray AbuZayyad, the recently appointed president of Rolm, reportedly assured NRUG members at a meeting last month that the Rolm name would not disappear within IBM, but he would not provide further clarification about company direction.

Some potential users are still unclear about Rolm's plans.

Gerard Pelchat, data processing center director for Laval University in Quebec, recently entertained private branch exchange requests for proposal from three different vendors, including Rolm. One of the top reasons why the university decided not to award the bid to Rolm was because the company's representatives could not answer Pelchat's questions concerning Rolm's future.

In the absence of a clear product line direction from IBM, user speculation has arisen about the future of the Rolm CBX. User confusion usually translates into product sales problems. The longer IBM waits to share its telecommunications plans and its plans for the future of the CBX product line, the more widespread user uncertainty will become.

Garrison said many NRUG members pressed AbuZayyad about PBX product direction but received no valuable information about the makeup or capabilities of the next CBX.

High-ranking IBM sources have refuted user speculation that the next version of the Rolm CBX, the CBX 1Il, will be part voice switch and part IBM

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PRIVATE-LINE PROMOTION

Long-haulers offer cut-rate services

Programs seek to boost sales.

ITT Corp.'s long-distance unit, United States Transmission Systems, Inc. (USTS), and Cable & Wireless Management Services, Inc. both announced programs last week designed to boost use of their long-haul offerings.

USTS introduced a promotion that will offer users up to three months of private-line service free and agreed to waive one-time installation charges. To qualify for the promotion, which the carrier said could be worth up to $4,000 per user, private-line orders must be installed no later than June 30.

A customer committing to a one-year contract will receive one month of service free. A user who inks a two-year pact will receive one month free each year, as will a customer signing a three-year contract. The installation charge of $225 per line will be eliminated during the offer. Users will pay a flat monthly fee, averaging $550, which is based on mileage.

Cable & Wireless Management Services has reduced rates for its T-1 and 56K bit/sec services. The carrier said it dropped its monthly rates for 56K bit/sec links 20%. Rates for one-year service terms have been decreased 25%. The long-haul carrier also cut T-1 service rates by roughly 15% to 28% on 90% of its routes.

ACD net to aid quick delivery

continued from page 11

and boost total sales by replacing its current ordering system with a more efficient ACD-based network. Domino's, which opens an average of three stores per day, plans to have 10,000 franchises hooked to the ordering network by 1990.

Domino's becomes pizza power

Domino's, built on the marketing concept of home pizza delivery, has quickly grown from a regional chain to a large, nationwide pizza power. But, because of the chain's success, there are now several stores per metropolitan area, and customers dialing in orders often reach stores that do not serve their specific location.

Fearing this problem — coupled with ordering delays inherent in answering more than 100,000 orders a week — would alienate prospective customers, Domino's began building regional telemarketing centers that will eventually take and route orders to all stores.

"We wanted to minimize customer irritation," explained Dan Gonos, project manager for the pizza chain. "If a customer has to hang up and make a second call, he is as likely to call a competitor as he is to call another Domino's store."

Domino's now operates six regional telemarketing centers, each of which serves a large metropolitan area. These centers are staffed by trained salespeople, not telephone receptionists. Each facility has a Northern Telecom SL-1 digital private branch exchange outfitted with ACD software.

Three of these six sites have already been equipped with an NCR Corp. Series 9000 minicomputer, which is connected to all local stores via private lines provided by various Bell operating companies. Each of 60 Domino's stores have already been outfitted with an NCR Tower computer.

Under the new ordering system, a customer's call reaches the SL-1 at the telemarketing center and is switched by the ACD to the agent who has been idle the longest. Each such site has a dozen to 100 agents.

The agent enters the order and the calling party's phone number into the NCR Series 9000, which determines which store should receive the order by checking the phone number against a data base. The order is sent by private line to the NCR Tower in the appropriate Domino store, which then collects and prints the order.

Gonos, a former telecommunications coordinator for Electronic Data Systems Corp., said each ACD is capable of handling 22,000 orders per week.

"This ordering system gives us the ability to control our customer base instead of it controlling us," Gonos remarked. The customer data collected by the NCR Towers will be used to track customer histories, including information about order complaints and customers who have paid bills with bad checks.

The system's ability to compile and transmit each order quickly to the appropriate store is critical because the company guarantees it will take $3 off any order delivered after 30 minutes.

In addition to serving as a repository for customer ordering information, the NCR Towers will also handle administrative chores that had once chewed up three or four hours of a store manager's day. These computers handle employee payroll, list store inventory and compute what supplies must be ordered to meet projected customer pizza demands.

Gonos said he expected that use of the ordering net, combined with the placement of telemarketing professionals at the regional centers, will help boost the size of the average order, from $8 to $10 to $10 to $12.

Domino's hopes its franchise ranks will swell to 10,000 by 1990, and the company claimed new stores are being opened at a fast clip. Gonos said all of these sites may eventually be tied to the new ordering system.

Uncertain future hurts Rolm

continued from page 11

front-end processor.

More than 2½ years have elapsed since IBM bought Rolm. IBM is now pushing the concept of enterprisewide networking, selling unified data/voice corporate networks.

IBM has steadfastly maintained that it will work with the customers' chosen long-haul communications carrier in this effort. But this raises much curiosity about the role MCI Communications Corp. will play in this enterprisewide networking effort, given that IBM owns a sizeable chunk of the No. 2 long-distance carrier.

If it hopes to keep users from following Pelchat's lead and purchasing PBXs from Rolm competitors, IBM should share its plans for Rolm and its blueprint for wide-area networking with both current and prospective users.

DATA DELIVERY/ NET MANAGEMENT

"Communications managers who want to further their careers must move into the data world. When you digitize voice, you are not really transmitting voice, you are sending data. If a manager remains only in the voice world, at some point, he will become a dinosaur.

Victoria Blackford
Vice-president
Data communications planning and implementation
The Chase Manhattan Bank, N.A.
New York, N.Y.

SNA FORMATS

IBM manual muddle clears

Analysts misinterpret company documentation practices.

BY PAUL KORZENIOWSKI
Senior Editor

A recent effort by IBM to make its Systems Network Architecture documentation manuals easier to use has inadvertently created some confusion about the company's product documentation practices.

The latest issue of the "SNA Reference Summary," which documents SNA protocols, did not include IBM's Format Identification 4 (FID4) format. The format, which includes the transmission header needed to route data through an SNA network, was introduced in September 1984 and included in previous IBM reference manuals.

But at a recent consultant meeting, analysts thought they stumbled on a quiet policy shift when an IBM representative gave an inconclusive answer to a question about why FID4 was not detailed in the most recent manual.

Excluding the format, the analysts reasoned, would enable IBM to gain an edge on certain competitors, chiefly front-end processor vendors.

These vendors rely on format documentation to design their products. By not publishing the format, IBM makes the product design process of competitors more difficult.

"Vendors would have to spend more time and money designing products because additional components would have to be reverse-engineered," noted L. David Passmore, principal at Network Strategies, Inc., a consulting firm in Fairfax, Va.

Currently, front-end processor companies reverse-engineer certain product components. These vendors have to wait until IBM announces its products before such

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DATA DIALOGUE

BY DONALD H. CZUBEK

OS/2 leads PC into communications future

IBM's recent announcement of communications capabilities with its latest microcomputer, the Personal System/2, marks a turning point in personal computer communications. The product does not include any new communications protocols but did have a new operating system, the Operating System/2 (OS/2). This operating system will enable an IBM microcomputer to support two communications protocols concurrently, for the first time.

OS/2 transforms IBM microcomputers from single-user, single-function workstations to single-user, multifunction communications workstations. Limited hardware capabilities and the lack of a true multitasking operating system restricted the Personal Computer to use of only separate, stand-alone communications packages. The limitation became more obvious as microcomputer literacy increased and users began working with a variety of software applications.

If a Personal Computer user wanted to communicate to both of his company's IBM mainframe and to a Unix system, he was forced to take down one software package in order to run the other.

This procedure is not only clumsy and time-consuming for the Personal Computer user, it causes problems with IBM communications software on the mainframe, which sees a Systems Network Architecture device appearing and disappearing each time a switch is made.

IBM also announced that the second version of the Personal System/2's operating system, the OS/2 Extended Edition, will support both SNA and non-SNA protocols. In an SNA environment, both LU 6.2 Advanced Program-To-Program Communications and IBM 3270 communications will be supported for concurrent operation.

Support for IBM's 5250 terminals, LU Type 7, is also promised for a future release of the operating system.

The non-SNA communications that will be available in this operating system support asynchronous protocols emulating IBM's 3101 terminals and Digital Equipment Corp.'s VT100 products. An X.25 packet-switched network interface will also be supported in a future release. All of these capabilities combine to make the OS/2 Extended operating system a powerful base on which to build future distributed applications.

The value of mixed, concurrent communications becomes evident if we look at the communications requirements of the typical workstation user in a large organization.

Typically, the user might

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Czubek is president of Gen2 Ventures, a consulting firm in Saratoga, Calif.

Computer-Integrated Manufacturing market growth

(Dollars in billions)

	1986	1991	Compound annual growth rate
Processor and network products	$1.4	$2.9	16%
Software products	$1.0	$2.9	24%
Professional services	$3.1	$8.3	21%
Turnkey systems	$2.2	$5.3	19%
Total	$7.7	$19.4	20%

SOURCE: INPUT, MOUNTAIN VIEW, CALIF.

ELECTRONIC MAIL

Vendors unite to test X.400 compatibility

BY PAUL KORZENIOWSKI
Senior Editor

BERKSHIRE, England — Twenty vendors have signed up to take part in a demonstration here intended to show how their respective X.400 electronic mail products overcome equipment compatibility barriers.

The multivendor demonstration, the third of its type, is scheduled for this October at the Telecom '87 Trade Fair, a communications conference sponsored by the International Telecommunications Union. The organization holds a trade show every four years.

X.400 is a Layer 7 E-mail application included in the International Standards Organization's Open Systems Interconnect reference model. The X.400 event is being held to demonstrate the feasibility of linking different vendors' E-mail systems, according to Level-7 Ltd., a consulting firm here that is organizing the demonstration.

Companies planning to take part in the demonstration are AT&T, British Telecommunications plc, Danet, Deutsche Bundespost, Dialcom, Digital Equipment Corp., Hewlett-Packard Co., IBM, Kokusai Denshin Denwa Co., Ltd., Nippon Telegraph and Telephone, Nixdorf Computer Corp., Ing. C. Olivetti & Co., S.p.A., Philips Industries, N.V., Standard Telephone and Radio AG., Swiss Postal Telephone and Telegraph, Sydney Development Corp., Telenet Communications Corp., Telesystemes, Transpac and Unisys Corp. The participants come from the U.S., France, West Germany, Japan, UK and Switzerland.

Fourteen companies participated in the second X.400 demonstration, held at the Hannover Faire CeBIT '87 in March. IBM was conspicuously absent from that demonstration, even though it was one of half-dozen vendors taking part in the first demonstration held at the Hannover Faire CeBIT '86.

IBM manual muddle clears

continued from page 13

work can begin, a constraint that forces them to remain one step behind IBM. If the FID4 format is not documented, they will have an additional item to reverse-engineer and could fall two steps to the rear of Big Blue.

William Warner, director of business and systems manager at IBM's communications products laboratory in Raleigh, N.C., said the company has not made a policy change and the confusion stems from IBM's attempt to restructure its SNA documentation. "The FID4 formats were documented in two different places in our reference manuals," he said.

The formats were outlined in the "SNA Reference Summary," formerly called the SNA Formats and Procedures manual, and in diagnostic manuals for specific products, such as IBM's VTAM and Network Control Program. The company reworked the diagnostic manuals and included in them information, such as the FID4 format, that was formerly in both manuals.

Warner said the SNA reference manual describes how customers can attach devices to SNA architectures. It also outlines protocols such as PU 2.0 and LU 6.2, and SNA Distribution Services, which do not require FID formats.

The IBM manager said the company will publish any changes to FID formats in future product manuals.

Passmore said the change will not create any new hurdles for competitors. "As long as the FID format is documented someplace, competitors will be able to get their hands on it," he said.

He added that IBM's policy is still a bit murky. Older FID formats, such as FID2, are still included in the "SNA Reference Summary" manual.

"A user may go to the Reference manual, look at a FID4 format and think it is a FID2 format," Passmore noted. "The company should either take all of the FID formats out of the SNA reference manual or leave them all in it."

OS/2 leads PC into future

continued from page 13

want to access the IBM mainframe application DISOSS to send and receive electronic mail to his coworkers.

DISOSS uses LU 6.2 communications protocols to establish a session, and IBM's Document Interchange Architecture to transfer a document.

Users will also need access to the corporation's existing 3270-based applications since they may want to download mainframe financial data, load it into a spreadsheet and send graphic information with the piece of electronic mail. These requirements mean the microcomputer has to support SNA LU Type 2 and 3270 data streams.

Typical users might also want to access non-SNA hosts such as a Unix host or they may want to sift through information stored on public data bases. These requirements mean the personal computer has to emulate an asynchronous terminal, such as an IBM 3101 or DEC VT100.

If users wanted to perform all of these tasks on a Personal Computer running the PC-DOS operating system, they would spend most of their time switching between communications packages, rather than completing useful work.

> There is a price to be paid for concurrency, and that price is storage utilization and CPU cycles. The bottom line will certainly be greater storage requirements.

Under the OS/2 Extended operating system, however, users would have all of these communications alternatives available simultaneously, along with the application software required to support each activity.

There is a price to be paid for this concurrency though, and that price is storage utilization and CPU cycles. The OS/2 product announcements didn't include any storage estimates, although one could get a rough estimate by adding up the size of IBM's existing Personal Computer-based communications packages. The bottom line will certainly be greater storage requirements.

Potential productivity

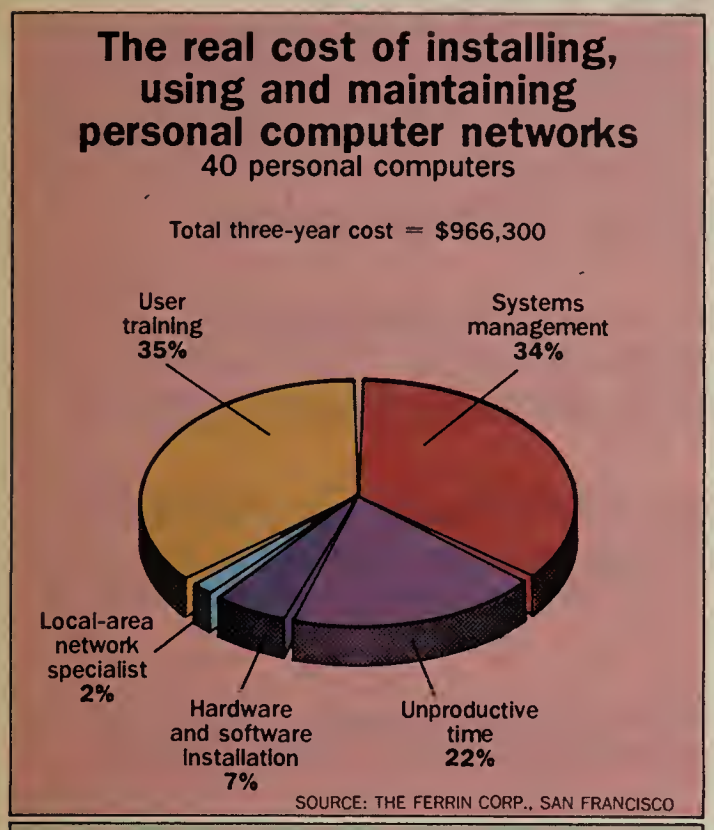
For users who require concurrent access to more than one remote resource, the price of OS/2 is reasonable. The potential productivity increases for these users will more than offset the additional costs incurred.

However, there is a second price to be paid for the use of OS/2 products, and that is time. Users will have to wait until at least 1988 before the first release of the OS/2 starts shipping, and IBM thus far has refused to even supply any shipment dates for the second version of the operating system, the OS/2 Extended Edition.

LOCAL NETWORKING

"Olsen's beaten up on everything that seems to be a de facto or coming standard. He's recently even beaten up on Unix, citing the confusion raised by having multiple versions [of the operating system]. Some of that is true, but the same argument can be made about Ethernet. Which Ethernet are you talking about?

David Scott
A Manufacturing Automation Protocol user with Deere & Co. Regarding Digital Equipment Corp. President Ken Olsen's assertion that Ethernet is adequate for factory use.



NOTE: The information in last week's graphic was based on five personal computers.

NETWORK COMPUTING FORUM

NCF links up with COS

Standards group adds 19 members for first meeting.

BY JOSH GONZE
Staff Writer

CAMBRIDGE, Mass. — The Network Computing Forum (NCF), an alliance formed three months ago to advance standards that would enable multivendor networks to share processing loads, recently announced it had joined the Corporation for Open Systems (COS) and added 19 new organizations to its 31 charter members.

The announcements came just prior to NCF's first technical and organizational meeting, held here last week.

NCF joined COS as an affiliate associate, a special membership status created under COS' Outreach Program for other standards groups. John Robotham, managing director at NCF, said the purpose of joining COS is twofold: to assure NCF's work will not be at odds with COS' and to help NCF navigate the formal channels it will use to set goals and encourage implementation of its own work.

"Both groups wanted to make sure that we stayed in sync with each other and shared information back and forth," Robotham explained.

COS is a vendor/user organization formed to foster implementation of standards in products. Its work is aimed at the establishment of test methods and certification procedures for equipment interoperability. Many user companies have expressed interest in joining COS but shy away from it because of the group's membership dues, which start at $20,000 for voting members.

The 100-plus representatives of NCF's member organizations who attended the two-day meeting heard technical presentations on such topics as building multivendor environments, software licensing for networks, remote access to supercomputers, registration and authentication of end users in multivendor environments, partitioning applications across a local-area network and remote processing of graphics applications.

NCF's 19 new members include Lotus Development Corp., the University of Missouri at Columbia, Sun Microsystems, Inc. and Hughes Aircraft Co. Its charter members include Apple Computer, Inc., the University of Michigan at Ann Arbor, 3Com Corp. and Caterpillar, Inc.

The overall goal of NCF, according to the group's published charter, is to "discuss, review and adopt network protocols, services and architectures that support vendor-independent integrated network computing environments."

Since the Chelmsford, Mass.-based Apollo Computer, Inc. is sponsoring and subsidizing NCF, membership is free. Any organization or company that uses or develops computer networking equipment and applications is eligible for membership.

NCF plans to identify and endorse networking applications and environments to work on top of hardware built according to existing standards, such as Ethernet. "If the forum is doing its job correctly — two years from now — what we're talking about today will become things that the various standards organizations are going to drive into formal industry standards," Robotham said.

LANMARKS
PAULA MUSICH

All might not be so well in local networking vendor land

Healthy growth being reported in recent quarters by some local networking vendors shouldn't lull users into thinking the market is rolling along nicely, thank you, and that all is well in local net land.

Market consolidation that began over a year ago is continuing, even as new companies enter the market with new and innovative, as well as me-too, products. Companies that take either approach — whether or not their products truly serve a need not addressed by others — sit in precarious positions. This is because of their late entry into the market.

More established vendors suffering growing pains may find it difficult, even impossible, to transcend those adolescent spasms. A market characterized by fast growth and little competition will tolerate mistakes more easily than a market marked by intense competition and slowing growth. The local networking market today is becoming less able to tolerate such mistakes.

> A market characterized by fast growth and little competition will tolerate mistakes more than a market marked by stiff competition and slowing growth.

Personal computer networking vendors state that personal computers are the workstation of choice, as if this were gospel. They gleefully point to all those unconnected personal computers in the market as wide open territory for their marketing efforts. (International Data Corp. recently reported that only about 10% of all business personal computers are connected via a local network.)

The truth is that a large number of those personal computers will never be connected because there is no need for that connection.

The lesson in all of this for users is not how to invest in high-tech companies, but how to invest in technology that you have to live with and support for years to come. Users need to look beyond the capabilities of a vendor's products and examine the company — how well it is run and how solid its footing is in the market.

It's not enough to ask what kind of support the company provides for its products; it's important to look for a real commitment to that support. This commitment can be gauged by the extent of the company's customer service organization and the amount of resources the company puts behind that organization.

The support track record for multivendor networks should also be investigated. If you want to exist in a multivendor environment, it's also important to closely scrutinize that firm's commitment to standards. Even large, well-heeled companies entering new markets should be closely questioned about their commitment to standards.

The decision to make major investments in networking products cannot be made in a vacuum, looking solely at the features and performance of the products themselves.

NETWORK NOTES

Network General Corp. of Sunnyvale, Calif., and **Datapoint Corp.** of San Antonio, Texas, recently announced a joint development and OEM license agreement under which the companies will develop a version of Network General's Sniffer protocol analyzer for Datapoint's Advanced Resource Computer (ARC) networks. Under the terms of the agreement, the two companies will work to extend the Network General capture module and protocol interpreters that support Datapoint's ARC local-area networking system software.

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COMPUTERPAT
U.S. Data Processing Patents
INSPEC
High Technology Topics
Menu—The International Software Database
International Software Listings
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Online Microcomputer Software
Software Descriptions and Reviews
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Disclosure
(Selected Databases)
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COMMUNICATIONS MANAGER

Budget study released

A recently completed study on communications budgets by Market Information Center, Inc. indicates a 6.4% growth in communications spending for 1987 over 1986, with personnel costs accounting for a good portion of the increase. For more information, contact the Market Information Center, Inc., Marlborough Executive Park, 65 Boston Post Road West, Marlborough, Mass. 01752, or call (617) 460-0880.

MANAGEMENT TACTICS

Selling network schemes: Part 2

Careful planning, RFP keys to success.

Second of a two-part series on writing internal business proposals and preparing requests for proposal. Part 1 introduced the concept of internal business proposals used to sell upper management on networking projects. Part 2 continues that discussion and offers some tips on preparing RFPs.

BY MICHAEL FAHEY
Senior Writer

For a communications manager seeking upper management's approval for a major equipment acquisition, a streamlined "Phase Zero" business proposal can serve as a trial balloon to gauge management's attitude about planned change in the communications operation.

Once upper management gives its blessing to an initial "Phase Zero proposal," it is time for the communications manager to expand the proposal to include a complete assessment of the costs and benefits that will result from continuing the project.

One of the most important parts of an internal business proposal is a description of the proposed new system, according to Carlos Santiago, president of Harbinger Group, Inc., a Norwalk, Conn., consulting company specializing in office automation and telecommunications management.

It is here that the system's function, as well as its scope and limitations, are outlined, Santiago said.

Essential elements of an effective request for proposal

- Rules for submission
- Introduction
- System requirements
  - Traffic data (with growth projections)
  - Maintenance considerations
- Facility and support requirements

SOURCE: HARBINGER GROUP, INC., NORWALK, CONN.

The system's architecture, and how that architecture relates to the current system architecture and interfaces, is discussed at this point, along with performance goals and ways of assessing performance.

Aside from the more technical aspects of the system concept, Santiago said, any policy or organizational changes that may be necessary in implementing the system should be outlined. "You should

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GUIDELINES

ERIC SCHMALL

How to become a proficient pollster

The success of a communications department is intimately entwined with user wants, needs and preferences.

Determining what these are can be accomplished through research surveys. Polling, often seen as a simple talent, is an important skill to understand and develop. If you want to know what the public wants, just jot down some questions, distribute them, collect the results and go on from there. Right? Wrong.

If your questions are ill-formed, if they are not asked of the right people, or if you're somewhat fuzzy about what you want to learn, you are designing a disaster of considerable proportions. Bad data will lead to bad conclusions and decisions.

Surveys are powerful tools. So are chain saws. But put in the wrong hands, they summon messy visions.

The information age has made all of us comfortable with surveys, polls, straw votes and things of that nature. The media constantly assail us with statistical survey results gathered by veteran pollsters such as Gallup, Harris and Roper, television networks and advertising agencies. It all looks so easy and quickly accomplished.

If communications managers want to pursue this type of research, they would be wise to consider several important rules.

First, a manager must thoroughly understand what type of information is needed. Should user knowledge of phone features or their satisfaction with them be tested? Should user preferences for future services or their perceptions of future needs be gauged? These crucial delineations form the basic structure of the survey.

Next, the author has to tackle the issue of question formulation. Does the manager want open-ended questions, which will allow the respondent to complete a series of statements? Or would closed-ended inquiries, where the polled individual is restricted to a fixed number of responses, be preferable?

Closed-ended questions are easier to tabulate and interpret. Does the survey team want to measure response intensity? If so, closed-ended questions should have response scales, for example: Strongly Disagree, Slightly Disagree, Neither Disagree Nor Agree, Slightly Agree and Strongly Agree.

Finally, the questions must be written clearly and edited carefully to comb out any biased wording that might invalidate the answers.

The last crucial aspect of survey-taking is distribution. The team has to define its target. Where a total sample is impossible or impractical, the survey team has to understand and employ proper statistical sampling techniques in order to draw valid conclusions about the entire population.

While none of these principles demand that only professional pollsters conduct useful surveys, the communications professional needs to become acquainted with these methodologies before going into the opinion-finding business.

Textbooks on the subject should provide more than sufficient guidance on the effective use of this research tool.

Schmall is network systems manager for an insurance holding company.

SEMINARS

Executives from Nynex Corp., NEC Corp., US Sprint Communications Co. and MCI Communications Corp. will be among the featured speakers at an open meeting sponsored by the Association for the Advancement of Communications Technology (AACT) from 6:30 p.m. to 9:30 p.m. on June 24 at State University College of Technology at Farmingdale, N.Y.

Topics to be discussed at the meeting will be the growing use of fiber optics in business communications systems, long-distance calling services and fourth-generation private branch exchange systems. There will be a $5 admission fee. For more information, contact George Allen, Public Relations, State University of New York, Agricultural and Technical College, Farmingdale, N.Y. 11735.

Siemens Information Systems, Inc. is sponsoring a one-day seminar for communications consultants that will feature product overviews and demonstration of Siemens' Saturn R PBX. The seminar will offer information on the system's architecture, software, applications and its new Automatic Call Distribution package.

The seminar will be held on June 23 in San Francisco; on July 9 in Chicago; on July 14 in New York; on July 16 in Boston; on July 21 in Washington, D.C.; and on July 28 in Atlanta.

For registration, call Siemens' consultant hotline at (800) 472-8876. For more information, contact Susan Gauff, Siemens Information Systems, 5500 Broken Sound Blvd., Boca Raton, Fla. 33431.

The Tele-Communications Association (TCA) is issuing a call for papers that "would contribute to the field of knowledge in telecommunications in the general categories of research and trends, technical development and management."

The papers, which are due July 15, must be original and broad in scope or an advancement of a specific area of study, such as information architecture or facilities planning. TCA officials will select the best papers for presentation by the authors at TCA's annual conference in September.

Papers should be presentable in 15 to 20 minutes and can be submitted to the TCA Corporate Office, Attention: Education Committee, 1515 W. Cameron, Suite B-140, West Covina, Calif. 97190. For further information, contact Dave Baumgarten, McGraw Hill, Inc., 7400 South Alton Court, Englewood, Colo. 80112.

Selling network schemes: Part 2

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clear those changes with the powers that be," he said. "When the changes come up, you don't want them to be a surprise."

Santiago said that what he describes as the "operational requirements" of the new system should be laid out in this section of the proposal. These include requirements such as power and the physical location of the new equipment. According to Santiago, more than a few private branch exchanges have been purchased without proper room being set aside for their installation.

"The idea is to include as much as possible about the system in a clear and understandable manner," Santiago said.

When it comes time to put forward the detailed financial justification and cost evaluation of a major project, the communications manager should turn to the organization's accounting and finance department. "Let them do the work," Santiago said. "That's what they are there for."

When a major new communications system is proposed, management and other members of the organization must be aware of the communications manager's plan for implementing and supporting the new operation. Therefore, the proposal should include a description of the personnel needed to implement and operate the system as well as what user training will be offered and what sort of plan will be implemented for converting to the new system. Security and disaster recovery considerations should be dealt with in this section of the proposal.

All internal business proposals should include alternatives to the proposed plan and a realistic assessment of the technical and financial risks involved in implementing the plan, Santiago said.

When it comes time to approach potential suppliers of the new system, an RFP is prepared and submitted to vendors. Exactly when this part of the process occurs varies. "For a major capital expenditure, you may need to an do RFP first," Santiago said. "Management's tolerance for error on a major capital expenditure is only 10%. That is, you can only miss by 10%, so you need to do an RFP to get your numbers."

There are four key sections to an RFP, Santiago said. The first section details the rules for submission. Here, the communications manager lays out all of the requirements for proper submission of a vendor proposal. This includes the final date and hour of vendor submissions, evidence of the vendor's financial stability and any other customer stipulations.

In the introduction, the communications manager should describe his organizaton and the problem the RFP is seeking to address.

The next section of the RFP covers system requirements. Santiago said that in some cases, a communications manager may not have available the number of lines and trunks required for a new system. The manager can then list the average number of long-distance and local calls made by each station. "You need to give some quantitative data so the vendors are able to build a model," he said.

Maintenance considerations are a form of system requirement, and they should be put forward in this section of the RFP. Here is where the user asks the vendors to describe the availability of spare parts for their equipment. Vendor response time to system problems and breakdowns is an important maintenance consideration and should be spelled out in writing by the vendor, as should the vendor's definiton of a major failure and a minor failure. "You'd be surprised at the range of answers you get from vendors," Santiago said. "You can find out that they haven't done their homework."
that vendors should be queried about their backup disaster plan.

"Some vendors such as Northern Telecom have backup PBXs on trailers ready to be loaded onto a plane and shipped out to you quickly in case of a fire or other kinds of disaster," Santiago said. "Other vendors don't have that setup."

A section of the RFP should deal with facility and support requirements. "Here is where you deal with all the requirements of preparing a telephone equipment room," Santiago said. "Heating, ventilating and air-conditioning as well as power considerations should be addressed at this point."

The weight of the equipment and floor loading considerations are an important part of facility and support requirements, and they should be spelled out clearly by the vendor. The conditions under which the manager will accept the equipment should also be outlined in a written agreement between user and vendor.

When the system is actually delivered, the manager should be available to observe its initial testing. "The user should be there at the beginning of testing," Santiago said. "You want to make sure the proper testing process is being followed."

NEW PRODUCTS AND SERVICES

See inside for:
- ▶Infortext call accounting system
- ▶Racal-Milgo multiplexer
- ▶Concord broadband modem

▶ *NET MANAGEMENT*

M/A-Com offers remote control

ASP disperses packet management.

BY JIM BROWN
New Products Editor

GERMANTOWN, Md. — M/A-Com Telecommunications, Inc. recently announced an Auxiliary Service Processor (ASP) that extends the functionality of its central site packet-switch network management system to remote locations.

The ASP can control M/A-Com's CP9000 Network Packet Exchange switch, which supports up to 600 ports, and smaller X.25 switches and other devices attached to the CP9000. The product will enable users with geographically dispersed Integrated Packet Networks to set up regional control points that complement M/A-Com's Network Control Processor system.

The ASP consists of a CP9000 Network Packet Exchange processor board, control terminal and software. Because the ASP board is configured with commands downloaded from the central site Network Control Processor, network managers can block access to certain network control functions from the ASP. For example, a network manager may want to give local users the ability to add local network users but prevent a user in one location from accessing a CP9000 in another location.

The product will enable local personnel to access network management functions in order to test or reconfigure attached devices, rather than requesting that work be performed by the central site network control manager. The Network Control Processor in the central network operations center is used to configure each remote ASP.

The ASP will make it possible for local users to down-line load operational software and configuration data to devices supported by the CP9000.

The ASP will also transfer information about its CP9000 Network Packet Exchange to the central site Network Control Processor, translate local address and access security, and store event and call record statistics.

The ASP is expected to be priced in the $25,000 range.

M/A Com Telecommunications is located at 11717 Exploration Lane, Germantown, Md. 20874, or call (301) 428-8500.

▶ *SWITCHES*

Telegence releases Tokenstar

BY JIM BROWN
New Products Editor

WESTLAKE VILLAGE, Calif. — Telegence Corp. recently released a 96-port data switch capable of supporting asynchronous terminals, modems, computer ports and other peripherals using twisted-pair telephone wire.

The Tokenstar 3400/3416 can link terminals and other peripherals to computer ports over twisted-pair wire at speeds up to 1M bit/sec. The switch can also be implemented using the firm's Tokenstar data-over-voice product to enable customers to share telephone wir-

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▶ *TOKEN-RING CONNECTIONS*

DCA gateway bows

IrmaLAN links PCs to mainframe.

BY JIM BROWN
New Products Editor

ALPHARETTA, Ga. — Digital Communications Associates, Inc. (DCA) recently introduced a gateway that enables personal computers connected to IBM Token-Ring local networks to access mainframes through IBM 3725 front-end processors.

The firm's personal computer-based IrmaLAN 3725 Gateway allows personal computers to communicate with a mainframe through an IBM 3725 front-end processor attached to an IBM Line and Token-Ring Attachment Base/Token-Ring Interface Coupler (LAB/TIC). That LAB/TIC supports connection of a Token-Ring network to the IBM 3725.

The IrmaLAN 3725 Gateway package operates on the same personal computer that runs the firm's IrmaLAN Systems Network Architecture Workstation or IrmaLAN All Points Addressable (APA) Graphics Workstation software packages. The firm also enhanced its IrmaLAN SNA Workstation and IrmaLAN APA Graphics Workstation packages to support Token-Ring-to-3725 and Token-Ring-to-IBM 3174 81C terminal cluster controller connections.

The IrmaLAN SNA Workstation and IrmaLAN APA Graphics Workstation products are terminal-emulation packages that reside on personal computers attached to IBM Token-Ring or other Network Basic I/O System-compatible networks. The packages provide microcomputer-to-mainframe link functionality to networked personal computers.

The IrmaLAN SNA Workstation makes the personal computer appear to the host as an IBM 3278 or 3279 terminal, and it allows a personal computer printer to appear as an IBM 3278 printer. The IrmaLAN APA Graphics Workstation supports IrmaLAN SNA Workstation functions in addition to providing personal computer access to IBM mainframe-based APA graphics packages.

Working with the IrmaLAN 3725 Gateway, either of the Workstation packages will support up to five concurrent host sessions. Those sessions can be displayed on the personal computer running the Workstation software, or they can be distributed to up to five different network-connected personal computers.

The IrmaLAN 3725 Gateway is priced at $395. The cost to upgrade existing IrmaLAN SNA Workstations or IrmaLAN APA Graphics Workstation packages is $50.

Digital Communications Associates is headquartered at 1000 Alderman Drive, Alpharetta, Ga. 30201, or call (404) 442-4000.

First Look

RJE package for cluster controller-attached PCs

Network Software Associates, Inc. released software that allows an IBM Personal Computer attached to an IBM 3274 or 3174 terminal cluster controller to perform batch file transfer with an IBM mainframe. The firm also released a package allowing 3274- or 3174-attached personal computers to emulate an IBM 3278 or 3279 Information Display Station.

The **Adapt3274 RJE** supports IBM's 3770/RJE bulk data transfer communications protocol. It makes personal computers appear to the host as IBM 3770/RJE workstations.

The package allows the personal computer to transfer files in background mode, while a DOS application runs in foreground.

Other features include automatic data compression and compaction, unattended operation, automatic recovery, the ability to toggle between DOS applications and file transfer, and an optional Application Programming Interface.

The **Adapt3274 IDS** package makes personal computers attached to a 3274 or 3174 controller appear to the host as either an IBM 3278 or 3279 terminal and one or two 3287 printers. With the package, personal computers can concurrently access up to three mainframe sessions or up to two printer sessions. The package also supports file transfer and provides a toggle key between a DOS application and host sessions, as well as definable function keys.

The packages require an IBM Personal Computer with at least 256K bytes of random-access memory and an IBM 3278/9 Emulation Advanced Adapter Board. The packages work with personal computers attached to controllers outfitted with a Distributed Function Terminal port.

The Adapt3274 RJE package is priced at $985, and the Adapt3274 IDS package costs $585.

Network Software Associates, Inc., 22982 Mill Creek, Laguna Hills, Calif. 92653, or call (714) 768-4013.

BBN enhances its C/10 PAD

BBN Communications Corp. introduced software that enables its C/10 packet assembler/disassembler to operate within IBM Systems Network Architecture environments.

The **Advanced C/10 SNA PAD** now forms the high end of the company's C/10 line of PADs. Compatible with IBM's front-end processor-resident Network Control Program Pack-

See **BBN** page 20

BBN from **page 19**
et Switching Interface and other IBM integrated X.25 interfaces, the product supports all SNA devices and will switch SNA 3270 devices between several hosts. Its dual 64K bit/sec X.25 network links provide terminal controller-to-host, terminal-to-terminal and host-to-host connections.

The product also allows virtual circuits in a BBN Communications X.25 network to replace dedicated point-to-point Synchronous Data Link Control links.

Pricing

Prices for the Advanced C/10 SNA PAD start at $9,350.

BBN Communications Corp., 70 Fawcett St., Cambridge, Mass. 02238, or call (617) 497-2683.

Limited-distance multiplexers bow

Racal-Milgo, Inc. introduced three new multiplexers designed for communications over distances of up to 5,000 ft.

The eight-port **Omnimux 2100,** 16-port **Omnimux 2200** and 32-port **Omnimux 2300** support IBM Type A and compatible devices, including IBM 3274 terminal cluster controllers.

The units support common addressing and are designed for point-to-point environments or multidrop environments.

All three of the units will support communications over fiber-optic or coaxial cable at speeds as high as 2.36M bit/sec.

Starting prices for the three models range between $995 and $2,380.

Racal-Milgo, Inc., P.O. Box 407044, Fort Lauderdale, Fla. 33340, or call (305) 475-1601.

Concord introduces broadband modem

Concord Communications, Inc. added a broadband modem to its MAP-ware product line, which connects VMEbus controllers to broadband networks based on the Manufacturing Automation Protocol.

The software-controllable **Series 1300 VMEbus Broadband Modem** supports speeds up to 10M bit/sec and can operate over user-defined frequencies. The modem can be controlled by the Motorola Microsystems Division MVME373 Advanced MAP Network Interface Module.

The device's analog filtering permits operation within adjacent channels on broadband networks. The modem also features loop-back and antijabber circuitry.

Concord Communications also announced it will supply the modem to Motorola Microsystems Division.

The Series 1300 modem is also available to end users.

Pricing

Pricing for the Series 1300 is $1,150.

Concord Communications, Inc., 397 Williams St., Marlboro, Mass. 01752, or call (617) 460-4646.

Baluns link devices over twisted pair

Computer System Products, Inc. unveiled a line of baluns that adapts coaxial, twinaxial or dual coaxial cable leads for use with twisted-pair wire.

The new baluns are short wires that have coaxial, twinaxial or dual coaxial leads at one end and telephone-type connectors at the other end.

The coaxial, twinaxial or dual coaxial lead connects to the computer port or terminal, while the twisted-pair wire strung between devices plugs into an RJ11 or RJ45 connector.

The new line includes the **3270 Balun** for IBM 3270 terminals and controllers; the **Twinax Balun** for the IBM System/34, System/36 and System/38 minicomputers; and the **Wang Adaptor** for Wang Laboratories, Inc. devices.

The baluns are available in several configurations. The 3270 Balun comes with a 1-ft length of coaxial cable and 10 ft of twisted-pair wire.

Pricing

Prices range from $19.95 to $45, with volume discounts available.

Computer System Products, Inc., 740 Washington Ave. N., Minneapolis, Minn. 55401, or call (800) 422-2537.

UDS debuts DSU with secondary channel

Universal Data Systems, Inc. enhanced its 9.6K bit/sec digital data service unit (DSU) with the addition of a secondary channel that carries diagnostic information.

The firm's **DDS-2 96** is designed to work with AT&T's Dataphone Digital Service with secondary channel offering. The device's primary channel transmits synchronous or asynchronous data in full duplex at speeds up to 9.6K bit/sec.

The asynchronous secondary channel operates at 110, 150 or 300 bit/sec and transmits operational diagnostic information about itself to a central network management center.

Diagnostic and network control functions supported over a secondary channel include bit error rate reporting, loop-back testing and status reporting.

The secondary channel operates alongside the primary channel. Through the use of a protocol based on the CCITT's V.25bis recommendations, the secondary channel could be used as a clear channel for transmission of data.

The DDS-2 96 is listed at $750.

Universal Data Systems, Inc., 5000 Bradford Drive, Huntsville, Ala. 35805, or call (205) 721-8000.

Package links Mac to host systems

Linkware Corp. released software that allows Apple Computer, Inc.'s Macintosh family of personal computers to transfer files with host computer systems from various vendors.

With the **Mac Connection** package, a Macintosh XL, Macintosh 512, Macintosh 512E, Macintosh Plus or Macintosh SE can transfer files with a host-based Linkware Information Server package installed on IBM, Digital Equipment Corp., Hewlett-Packard Co. or Unix-based host computer systems.

The new package will support asynchronous transfer of files in Macintosh, binary or text formats.

A Linkware Transform utility supports the conversion of various Macintosh file formats to the file format of the host system. It will also convert one Macintosh file format to another and will convert the Macintosh file formats to an IBM Personal Computer file format.

Script Language and Linkware Macro utilities support Linkware application development on the Macintosh. With Script Language, users can create automatic logon routines, and the Linkware Macro utility allows repetitive routines to be performed with a single click of a Macintosh mouse.

The Mac Connection package is priced at $300.

Linkware Corp., 128 Technology Center, Waltham, Mass. 02154, or call (617) 894-9330.

Transmission impairment test set

Ameritec Corp. introduced a handheld voice/data transmission impairment test set that is the size of a pocket calculator.

The menu-driven **AM-48** complies with IEEE 743-1984 and can operate with batteries or AC current. The tester has the ability to send various test-tone signals within the 200-Hz to 20-kHz frequency range. It also has the ability to send a continuous three-tone slope, a user-defined continuous sweep tone, a fixed 1,004-Hz tone and a peak-to-average ratio waveform. Some of the items the tester will measure include level and frequency, idle channel noise, noise with tone, three-level impulse noise, phase and gain jitter, and transients and signal-to-noise ratio. The unit also offers a selection of noise filters.

The microprocessor-based product has enough memory to store and recall 10 preprogrammed test setups.

It also has the ability to display levels in absolute and relative readings and includes a microphone and speaker that allow it to function as a telephone. The device will also interface to a printer.

Pricing

Ameritec's AM-48 is priced at $3,495.

Ameritec Corp., 800 East Arrow Highway, Covina, Calif. 91722, or call (818) 915-5441.

Firm releases pair of multiplexers

Datatel, Inc. introduced a statistical multiplexer that will support port selection and contention as well as act as a data-switching device. The firm also introduced a time-division multiplexer that can combine two adaptive differential pulse code modulation (ADPCM) voice channels and one data channel onto a single 56K bit/sec line.

The model **DCP5032,** which can act as a statistical multiplexer, switching multiplexer or data switch, is configured from either an external console or a front-panel console. That console will allow configuration information to be down-line loaded. The unit will also support flow control, automatic speed recognition, camp-on, built-in diagnostics and a separate printer port. The DCP5032 will support either eight or 16 channels. The eight-channel model can be upgraded to 16.

When in the statistical multiplexer mode, the device can concentrate up to 16 asynchronous inputs over a single, high-speed output link. Inputs can be from either dial-up or dedicated lines operating at speeds up to 19.2K bit/sec. The device will also allow users at one end to request connection to a specific unit at the other end. If that unit is busy, the user can be placed in a queue. Once the connection is made, that line goes into

statistical multiplexer mode.

According to the firm, a single DCP5032 can be configured to act as a data switch, which will allow several local users to contend for local computer ports through a DCP5032. Several of the DCP5032s can be linked to give the appearance of an eight-, 16- or 32-port data switch.

The model **DCP9057** time-division multiplexer can combine two 32K bit/sec ADPCM voice channels with one synchronous 4.8K bit/sec data channel for transmission over a single 56K bit/sec link. By also supporting transmission at 64K bit/sec and 112K bit/sec, the device will allow synchronous data channel operation at up to 42K bit/sec.

The product has seven front-panel indicators.

The model DCP5032 is priced at $2,650 for the 8-port model and $3,650 for the 16-port model. The model DCP9057 is priced at $2,600.

Datatel, Inc., Cherry Hill Industrial Center, Pin Oak and Springdale Roads, Cherry Hill, N.J. 08003, or call (800) 424-4451.

Pack collects call records from 10 phone systems

Infortext Systems, Inc. announced a personal computer-based call accounting system that can collect and process station message detail recordings for up to 10 private branch exchange or key system locations.

Dubbed the **CAPS** systems, the IBM Personal Computer AT-based product is available in two models and is an addition to Infortext's function key and menu-driven OS Call Accounting System family. The **CAPS V.** allows central report generation for up to five locations, while the **CAPS X.** accommodates 10 locations.

The products run on a central site IBM Personal Computer AT, which processes call detail recording data for each telephone system. The software is capable of handling polling applications and will support up to 4,000 extensions, 350 trunks and 350,000 call records per month.

The package will provide a number of standard call detailing reports, thereby allowing managers to examine call records in various ways.

It will provide call records for each extension as well as entire departments or divisions.

The package will also pinpoint which trunks are more utilized than others and the length of calls, and it will flag the most costly calls within the reporting period.

Pricing

Prices for the packages range from $5,000 to $20,000, depending on the number of phone systems covered.

Infortext Systems, Inc., 1067 E. State Pkwy., Schaumburg, Ill. 60173, or call (312) 490-1155.

Telegence Tokenstar out

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ing with voice systems. Customers must provide adapters that convert RS-232 interfaces to either an RJ-45 or RJ-11 telephone-type connector.

The Tokenstar 3400/3416 supports up to six 16-port dual card modules in a 19-in. rack chassis. Additionally, each port module supports one RJ-11 slot that can be used to connect multiple Tokenstar 3400/3416s together in a daisy-chain fashion. That extra slot can also be used to link the Tokenstar 3400/3416 to a telephone wall jack, which is the entry point for the data-over-voice Tokenstar network.

The firm's Tokenstar data-over-voice network, which uses a virtual token-ring on a physical star network, links asynchronous terminals to asynchronous host ports over existing telephone systems. Telephones are connected to the Tokenstar equipment, which then connects to the wall jack.

Tokenstar devices will broadcast statistically multiplexed data packets within the 500-kHz to 1-MHz range of the twisted-pair wire's bandwidth. That packetized data is moved onto the twisted-pair wire network in bursts running at 1M bit/sec.

Voice signals, the firm said, are kept within the 4-kHz range. Filters on Tokenstar access devices prevent cross talk between frequencies. The data and voice signals travel to a Tokenstar Hub located near the telephone-wire punch-down block.

The Tokenstar Hub strips the data from the twisted-pair wire and forwards it to the location for which it was destined, while the voice signal is passed along to a Centrex service or private branch exchange.

Pricing information

A 19-in. Tokenstar 3400/3416 rack and power supply costs $2,095.

Each of the 16-channel Tokenstar cards costs $1,695.

Telegence is located at 5655 Lindero Canyon Road, Suite 722, Westlake Village, Calif. 91362, or call (818) 707-3200.

Opinions

USER-VENDOR RELATIONS

WALTER ULRICH

Interdependence is the key

Successful business transactions occur when all parties to the transaction gain. Buyers of products and services are dependent upon their vendors, and vendors cannot succeed without customers.

Unfortunately, communications industry customers all too often see their suppliers as second-class citizens, and vendors treat their customers as the enemy.

Communications managers, procurement officers and vendor organizations all must share responsibility for vendor/customer antagonism, which has its roots in product design and development.

Lack of respect

Communications vendors often focus on technological trends and competitive thrust when designing or enhancing their products. They will always tell you that "the customer is king," but they dedicate too little effort to understanding what the customer really wants or needs. The chairman of one communications company I know of was unable to name his top 10 customers.

While lunch with the vendor representative can be an ego boost for the buyer, some communications managers become so busy that they do not want to waste time meeting with vendor salespeople. Others feel that their communications plans are of such proprietary importance that they tell their vendors as little as possible. Still others require vendors to embark on a Homeric odyssey before they are granted even a brief appointment.

Communications managers should be knocking down their vendors' doors to provide advanced product input, yet few are willing to commit prime time and resources to help vendors improve their offerings. Well-designed communications products are more efficient, easier to install, interconnect better with existing environments and offer greater control — all benefits that any customer should be willing to help vendors provide.

For their part, vendors should be begging their customers — and potential customers — for advice and criticism. Better designed and better positioned products result in higher revenues, fatter profits and happier customers. As Thomas Peters and Robert Waterman Jr. wrote in *In Search of Excellence*, being close to the customer is a prerequisite for vendor success.

To be fair, there are plenty of examples of solid customer/supplier cooperation, and the trend appears to be accelerating. American Airlines, Inc. and Tenneco, Inc. commit senior technology executives to participate in vendor advisory panels. Many banks and energy companies provide speakers for communications trade groups. Most vendors organize some kind of users group, though the effectiveness of those groups varies greatly.

Two associations offer good examples of special efforts being made by progressive professionals to enhance vendor/customer cooperation.

The Network Users Association (NUA) was founded in 1981 by major companies that have large investments in network systems, software and services. Those companies are concerned about the lack of industry standards and the lack of compatibility between various vendors' products. Their goal is to work together to communicate their needs to the major vendors.

The efforts of NUA members have been fruitful. Standards have flourished, and interconnection is getting easier all the time.

A second group, the Electronic Mail Association, was formed in 1983 to promote E-mail use and knowledge. Recognizing the importance of user input and the relative limitations of user budgets compared with those of vendors, the association has increased vendor dues while reducing those for user members.

Additionally, new user members are allowed to join for half the regular dues. The association feels that this policy will promote user membership and cultivate healthy user/vendor dialogue.

Mutual need

The interdependence of communications managers and their vendors is obvious. Each must have respect for the other. Communications channels must be open. Both sides must make commitments to exchange information, understand each other's situation and solve issues of common concern. Healthy user/vendor cooperation is essential to the success of our industries, the success of our companies and our personal success.

Ulrich is a partner at Coopers & Lybrand in Houston and is a board member on the Electronic Mail Association.

FCC UPDATE

ALAN PEARCE

Influential intellectuals

Federal Communications Commission Chairman Dennis Patrick, the most important policymaker in the telecommunications information industry, has selected three "intellectuals" as his closest aides.

The newly installed chairman has appointed Peter Pitsch as new chief of staff, Gerald Brock as the new chief of the Common Carrier Bureau and John Haring to the post of chief of the Office of Plans and Policy.

Pitsch, the only non-Ph.D. among the three, was once described as former Chairman Mark Fowler's "resident intellectual." He joined the staff in May 1981, just after Fowler was sworn in, and was chief of the Office of Plans and Policy until his promotion to chief of staff. Pitsch is ideologically opposed to the traditional rate base, rate of return and price regulation that has characterized the telecommunications industry since the FCC's creation in 1934.

As chief of staff, Pitsch will work closely with Patrick and with senior FCC staff to set the FCC's agenda. He has a broad background in telecommunications policy-making, having advised the FCC on spectrum allocation policy, telephone subscriber line charges, tariffs, the deregulation of dominant carriers, broadcast ownership rules and other issues.

Pitsch was an attorney at the Federal Trade Commission from 1976 to 1978, at which time he entered the private sector and worked for the election of President Reagan. He subsequently served on the Reagan Transition Team, prior to being appointed to the FCC in 1981. Pitsch received his undergraduate degree in economics from the University of Chicago, close to his native Wisconsin, and his law degree from Georgetown University in 1976.

Although soft-spoken and somewhat shy, Pitsch is a powerful policy-making force at the FCC and has built up a good reputation in the industry at large. He is also close to Patrick, having briefed him since Patrick became a commissioner three years ago.

Gerald Brock, the new chief of the Common Carrier Bureau, has a completely different personality from the man he succeeds. Former Chief Bert Halprin set a deregulatory agenda for himself and the bureau, without regard to the filings of so-called interested parties. Brock, unlike Halprin, is much more studious and analytical, and he will listen to conflicting views and read what is filed. Also unlike Halprin, Brock has spent most of his career as an academic and researcher.

Until taking over as chief of the Common Carrier Bureau, a position that many regard as the second most powerful job in the agency, Brock was chief of the accounting and audits division in the Common Carrier Bureau. He developed the new accounting and cost-allocation rules in CC Docket 86-111. Prior to that, Brock had worked for Pitsch when Pitsch headed the Office of Plans and Policy.

Brock, however, is not a career bureaucrat, having joined the staff in 1983 on "temporary" assignment. He has spent most of his professional life teaching, researching and writing. He is the author of two well-known textbooks, one on

Pearce is president of Information Age Economics, a telecommunications research firm in Washington, D.C.

If vendor lines have you crossed, let someone know about it. Send *Network World* a column for its Opinions pages. Manuscripts must be letter quality, double spaced and approximately 600 to 750 words in length. Disk and modem submissions are preferred. Columns should be timely, controversial, literate and technically accurate.

Contact Steve Moore, features editor, *Network World*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701, or call (617) 879-0700, ext. 584.

Opinions

▶TELETOONS — By Phil Frank

telecommunications and the other on computers, and he has headed numerous research projects. Brock's bachelor's degree is in mathematics and his Ph.D. is in economics. Both degrees are from Harvard University.

John Haring, the new chief of the Office of Plans and Policy — the chairman's think tank — also joined the staff in 1983. Haring taught economics at both the University of Maryland and the Univerity of Virginia. Unlike Brock, however, Haring has always been attracted to public policy and government. He served at the Federal Trade Commission, the Civil Aeronautics Board and the U.S. Department of Justice. He also worked briefly in the private sector as an economic consultant.

Haring received his bachelor's degree from the University of Virginia and his master's degree in philosophy and Ph.D. in economics from Yale. Haring's research interests focus on industry structure and the causes and effects of government regulation.

Patrick is not the first to surround himself with an intellectual think tank. Dean Burch, who headed the FCC from 1969 to 1974, had two close policy advisers with Ph.D.s, a former Notre Dame professor and attorney Henry Geller. Many believe the latter to be among Washington, D.C.'s most intellectual lawyers, if that is not an oxymoron. Burch, who now heads the International Telecommunications Satellite Organization, was the first chairman to attract intellectuals to the FCC and to use them extensively as policy advisers.

Nonetheless, the current crop of intellectuals differs starkly from the Burch team. Although Burch was a Republican, having headed the presidential campaign of Barry Goldwater in 1964, he had no vision of an unregulated industry. Patrick, on the other hand, is believed to be a deregulator in the Reagan and Fowler tradition. But with his group of research-oriented intellectuals, he is likely to move much more slowly and cautiously than did his immediate predecessor.

And there are those, including Capitol Hill staffers, who maintain that Patrick will stop the deregulatory trend completely — prior to its promised reversal in the event that the Democrats capture the White House in 1989.

TECHNICAL DISPUTES

JAMES CARLINI

A good lawyer isn't enough

Lawsuits and countersuits are becoming a new challenge to user and vendor organizations in the communications industry. Vendors are starting to prosecute to recover back payments, overdue balances, termination charges and other losses incurred through breaches of contract.

In some cases, the vendors are right to demand payment. But what about those instances where the customer refuses to pay because the vendor has not lived up to promises made at the time of purchase? In the case of a piece of equipment that never worked properly or a service that is unreliable, should the customer file a countersuit? What is the right course of action to follow?

If you talk to legal experts about problems such as this, they give you an opinion based on a legal perspective. The trouble is that they are not trained to assess the problem from any other perspective and they rarely have an adequate understanding of communications technology. What is needed is the perspective of someone who fully understands the technological issues that are relevant to the case.

When a dispute becomes a lawsuit, the party that retains technical expertise, as well as legal expertise, is in a much stronger position than the party that relies solely on a lawyer.

When going up against a vendor that has a technically expert staff, the nontechnical user needs a high-tech hired gun to equal or better the vendor from a technical standpoint.

Just as you bring in an accountant to advise you whether a contract is financially sound, you should bring in a technologist to measure the technological impacts a deal might have. Using a lawyer to assess technology and place a realistic value on it is like having a buggy whip manufacturer build the Starship Enterprise. What they know and what they must understand are worlds apart.

Unfortunately, this is how many organizations approach lawsuits as well as initial contract negotiations. If you are dealing with the local phone companies or other vendors that have developed contracts that are tailored to give them all of the advantages, you should have a technically expert consultant review the technical issues while a lawyer reviews the legal issues.

Every high-tech transaction has the potential of being misjudged by technical neophytes. If you're the buyer, you may get a bad deal. If you're the seller, you may give away something for next to nothing, as was the case with a pipeline company that recently thought it had negotiated a good deal to lease its pipeline right-of-way to a communications company.

Litigation on the rise

Will lawsuits increase as more vendor and user organizations develop a "get tough" policy on poor performance? Yes. Both sides are already taking a more aggressive tack. For example, there is already a movement by some real estate owners to assess the damages done to their properties by tenants who install telecommunications and information processing equipment without adhering to proper installation guidelines.

With more and more organizations relying on communications-based information systems, lawsuits related to them will increase.

The "People's Court" approach of filing lawsuits at the drop of a hat always looks effective on television, but in this industry, a good countersuit that is backed up by solid technical information will bring an overconfident plaintiff back down to reality in a hurry.

For users who decide a lawsuit or countersuit is the final route to take with unresponsive vendors, technical hired guns can be an ace in the hole when trying to prove that equipment has failed or when promises for a level of service have gone unfulfilled.

Your lawyers are only as good as the technical expertise you provide for them to draw from as they try to resolve a lawsuit based on the lack of performance of technology-based equipment or services.

Carlini is president of Carlini & Associates, a management consulting firm in Westmont, Ill. He also lectures on information technology at Northwestern University in Evanston, Ill.

NETWORK WORLD

THE WEEKLY FOR LEADING USERS OF COMMUNICATIONS PRODUCTS & SERVICES

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PLEASE ANSWER ALL QUESTIONS, SIGN AND DATE THE CARD.

1 My primary areas of activity. (Circle ONE only)
I am involved in evaluating communications (data, voice and/or image) products and services:
1. for *use within my own* company/organization
2. for *resale* to other companies/organizations
3. Both
4. Other (explain) _____

1a For communications, my primary responsibility is: (Circle ONE only)
1. Data Communications
2. Voice Communications
3. Both
4. Other (explain) _____

2 Circle only the ONE title classification which most applies to you.

Company Management
11. Chairman, Pres., Owner, Gen. Mgr., Partner, Director, CEO, VP, Dir. Head of Finance, Admin. Procurement

Communications Management
Data Communications
21. Management
VP, Dir., Mgr., Head, Chief: Data Communications, including Networks, Engineering, Design, R&D, Application Development
22. Supervisory/Staff:
Supervisor, Head: Networking, Design, Analysis, Engineering, R&D, Applications, Services
Telecommunications
31. Management
VP, Dir., Mgr., Head, Chief: Telecomm., Voice Comm., including Networks. Engineering, Design, R&D, Application Development
32. Supervisory/Staff: Supervisor, Head: Networks, Design, Analysis, Engineering, R&D, Applications Services
Factory Communications
41. Management
42. Supervisory/Staff

MIS/Data Processing
51. Management
VP, Dir., Mgr., Head, Chief: MIS/DP, Systems Application Development, Operations, Office Automation
52. Supervisory/Staff: Supervisor, Head of Systems Design, Analysis Applications

Others
75. Consultant
80. Educator
85. Financial Analyst
90. Marketing/Sales
95. Other _____

3 Job Function
Which one of the following best describes your functional involvement with communications (data, voice, and /or video) products? (Circle ONE only)

Corporate
1. Business Management, Planning and/or Development

Communications System/Network
2. Management, Planning and/or Development
3. Implementation and/or Operation
4. Other _____

4 Which one of the following best describes the primary business activity of your organization at this location? (Circle ONE only)

Consultants
11. DP/Communications Consulting Services
12. Consulting Services (except DP/ Communications)

End Users
13. Manufacturer (other than computer/communications)
22. Finance/Banking/Insurance/Real Estate
23. Education
24. Medicine/Law
25. Wholesale/Retail Trade
26. Public Utility/Transportation
27. Mining/ Construction/ Petroleum Refining/ Agriculture/ Forestry
28. Business Services (excluding DP/Communications)
29. Government: Federal
30. Government: State/Local

Vendors
41. Carrier: including AT&T, BOCs, Independent Telcos, Public Data Networks, International Records Carriers
42. Interconnect
43. Manufacturer Computer/Communications Equipment
44. Value Added Reseller (VAR), Systems House, Systems Integrator
45. Distributor
46. DP/Communications Services (excluding consulting)
95. Other _____

5 In which ways do you typically become involved in acquiring communication products (data, voice, and/or video) and services? (Circle ALL that apply)
1. Recommend/Specify
2. Identify/Evaluate Potential Vendors
3. Approve the Acquisition
4. None of the Above

6 Check ALL that apply in columns A and B.
A. I am personally involved in the acquisition process (specification, selection, approval) for the following products and services:
B. These products and services are presently in use at this location:

A	B	Product/Services
		Computers
☐	☐	01. Micros
☐	☐	02. Minis
☐	☐	03. Mainframes
☐	☐	34. Printers
		Data Communications
☐	☐	04. Communications Processors
☐	☐	05. Comm./Networks Software
☐	☐	06. Digital Switching Equipment
☐	☐	07. Facsimile
☐	☐	08. Modems
☐	☐	09. Multiplexers
☐	☐	10. Protocol Converters
☐	☐	11. Network Mgmt. & Control
☐	☐	12. Test Equipment
☐	☐	13. 3270 Controllers
☐	☐	35. Intelligent Terminals
		Telecommunications
☐	☐	14. PBXs
☐	☐	15. Key Systems
☐	☐	16. Central Office Equipment
☐	☐	17. Integrated Voice/Data Terminals

A	B	Product/Services
		Transmission/Network Services Equipment
☐	☐	18. Microwave
☐	☐	19. Satellite Earth Stations
☐	☐	20. Local Area Networks
☐	☐	21. Wide Area Networks
☐	☐	22. Packet Switching Equipment
☐	☐	23. Fiber Optic Equipment
☐	☐	36. T1
		Communications Services
☐	☐	24. Packet Switching Services
☐	☐	25. Cellular Mobile Radio Services
☐	☐	26. Electronic Mail
☐	☐	27. Enhanced Services
☐	☐	28. Centrex
☐	☐	29. Long Haul Services
☐	☐	30. BOC Services
☐	☐	31. Independent Telco Services
		Other
☐	☐	32. Factory Communications
☐	☐	33. Online Data Bases

7 Estimated value of communications systems, equipment and services:
A. which you helped specify, recommend or approve in *last* 12 months? (Check only ONE in column A.)
B. which you plan to specify,recommend or approve in *next* 12 months? (Check only ONE in column B.)

A	B		A	B	
1. ☐	☐	$10 million and over	6. ☐	☐	$100,000 - $249,999
2. ☐	☐	$5 million - $9.9 million	7. ☐	☐	$50,000 - $99,999
3. ☐	☐	$1 million - $4.9 million	8. ☐	☐	Under $50,000
4. ☐	☐	$500,000 - $999,999	9. ☐	☐	Don't Know
5. ☐	☐	$250,000 - $499,999			

8 Estimated gross annual revenues for your entire company/institution: (Circle ONE only)
1. Over $1 billion
2. $500 million to $1 billion
3. $100 million to $499.9 million
4. $50 million to $99.9 million
5. $10 million to $49.9 million
6. $5 million to $9.9 million
7. under $5 million

9 Estimated number of total employees at this location: (Circle ONE only)
1. Over 5,000
2. 1,000 - 4,999
3. 500 - 999
4. 250 - 499
5. 100 - 249
6. 50 - 99
7. 20 - 49
8. 1 - 19

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NETWORK WORLD
THE WEEKLY FOR LEADING USERS OF COMMUNICATIONS PRODUCTS & SERVICES

Features
June 8, 1987

Special Section: Communications careers

Network World's annual salary survey

Continued from page 1

gradual rise of communications from the corporate basement to the boardroom.

"In a growing number of industries, companies are recognizing that telecommunications can be used to benefit the business," notes Bob Hynes, telecommunications engineering manager at the *Los Angeles Times*. "Previously, companies viewed communications simply as a cost center."

However, compensation appears to be lagging one step behind such recognition. An informal telephone survey of *Network World*'s Panel of Communications Users, managers who have volunteered to share their views on important issues, found the average communications manager's salary rose 9% from $52,700 in 1986 to $57,300 for this year.

Of the 68 survey participants, the highest salary, $135,000, is being paid to a vice-president of data communications who oversees 250 employees at a Fortune 50 company. A telecommunications manager at a Midwestern university, with an eight-person staff, commanded the lowest salary, $28,000.

In many professions, a 9% increase would be deemed adequate, maybe even high, especially since inflation climbed slightly during the year. But approximately one out of every three managers says he feels his salary is lower than it should be, and a number of managers say their recognition is lagging a step behind their responsibilities.

> Approximately one out of every three managers says he feels his salary is lower than it should be.

One manager complains his company does not understand the benefits of merging voice and data applications. Others say turf fighting is preventing them from gaining corporate recognition and just compensation.

Job titles have not evolved to mirror communications employees' skill levels or areas of specialization. Few companies have positions for tariff analysts or network control center operators. Instead, these employees are usually lumped with traditional data processing positions and given titles such as programmer or analyst.

Even though the need for network experts outweighs the supply, employees are unable to leverage the shortage to increase the size of their paychecks.

Managers agree that such roadblocks are only temporary and progress is being made in raising communications from a boiler room issue to a boardroom issue. Many companies understand the benefits of merging voice and data applications and have restructured operations to take advantage of such benefits.

More than half of the respon-

Continued on next page

ILLUSTRATION ©1987 KEVIN POPE

From previous page
dents are responsible for both voice and data applications, 23.5% oversee voice communications and 20.5% manage their companies' data communications.

Candy Rodgers, manager of corporate communications at Del Monte USA in San Francisco, says companies are beginning to link compensation with budget size, a shift that will benefit many communications managers.

"Telecommunications expenses are far larger than any other single information resource expense," she says. "They cost more than mainframes and software. Consequently, the positions and salaries associated with communications are rising faster than any other position in the information resources organization."

James Weiss, regional vice-president of telecommunications for a subsidiary of Eastern Airlines, Inc., notes that more communications managers are gaining the titles of director, assistant vice-president and vice-president, rather than simply manager of telecommunications.

The most popular title identified in *Network World*'s survey is manager of telecommunications, with 23 claiming that position. Twelve respondents are directors of telecommunications, but only five have assistant vice-president or vice-president in their titles.

In order to climb the corporate ladder, managers must link communications capabilities with corporate strategic goals, an idea universally echoed among the respondents.

Harry Tompkins, manager of telecommunications planning and engineering at Ciba-Geigy Corp. in Ardsley, N.Y., explains, "Don't just say, 'We need a new PBX. We have this many people, and so we need this many trunks.' Talk to the business people at your company, and ask them to explain their business problems to you.

"If salesmen on the road can't easily contact each other, maybe a voice messaging system will help the company function more smoothly," he continues. "Users should no longer buy products for the sake of working with the latest technology. They should try to help the corporation get the best bang for its buck."

Donna Parker, vice-president of telecommunications and integrated office systems at R.H. Macy & Co., Inc. in San Francisco, says, "Telecommunications managers often become so involved in their side of the business, they overlook the bigger picture, namely what type of business the department is supporting."

The user panel recommended a number of ways to glean information on the bigger corporate picture, such as reviewing the company's annual report, volunteering to serve on corporate steering committees, asking other departments to share strategic plans and attending classes and seminars.

Sid Smith, manager of corporate telecommunications at Crowley Maritime Corp. in San Francisco, says, "Get buddy-buddy with other managers in your corporation. Politicking is an easy way of getting to know the company's business."

Once a manager understands the company's business and its strategic goals, he must convince upper management that he can help achieve those goals. Alan Johnson, telecommunications manager at Peabody Holding Co. in St. Louis, Mo., advises his counterparts to take their blue jeans off and put their pin-striped suits on.

"Your responsibilities will often depend on the image you portray," he says. "It is important that management perceives you as someone who understands the company's business."

The highest percentage salary increase, a 41% jump that could go as high as 45% by the end of the year, went to a telecommunications manager who made strategic planning a key component of her job. Before the manager joined the company three years ago, telecommunications was deemed a low-level corporate concern.

By demonstrating that communications could cut expenses and help the company meet strategic objectives, the manager gained the respect of the corporation's president, and she elevated her job to one of the company's most visible positions.

Such a rise does not come without a price, and corporations are beginning to demand more management abilities from their communications managers. The ambitious manager must seek out a means to acquire such skills.

One way is formal education. "For too long, communications managers have been concerned with earning a technical degree," says Brian McDonald, manager of telecommunications services at Lockheed Corp. in Calabasas, Calif. "A technical degree is limiting and hangs the sign 'Tech Manager' around your neck.

"You won't be promoted beyond a certain level since companies would be leery of trusting you with financial issues or strategic planning," he says. "You can't go anywhere in management without a business degree." More than one out of every five respondents have been granted an MBA, and a half-dozen managers say they plan to earn one.

If McDonald is correct, a number of managers may have trouble climbing the corporate ladder. Sixteen percent of the respondents have no college degree, and 9% have only two-year associate degrees.

The educational backgrounds of the managers with undergraduate degrees varied greatly. The most common degree was a bachelor's of science in electrical engineering, which a dozen managers hold. Other areas of concentration were business administration, economics, mathematics, psychology, physics, education, liberal arts, political science, computer science, English and radio and television.

Kerry Overlan, director of telecommunications at Commonwealth Energy Systems in Cambridge, Mass., prefers employees with a liberal arts degree. "We can take a person with a liberal arts degree and teach him communications technologies," says Overlan, who has an undergraduate degree in English.

"To succeed, an employee has to be able to write well, make presentations to upper management and communicate with coworkers," he says. "A liberal arts degree helps him attain these skills."

Experience seems to be a prerequisite for attaining management responsibilities. The average manager has 13 years of telecommunications experience, and 10 managers have been in the business for more than 20 years. The size of the average staff is 27 people, with four managers overseeing more than 200 employees.

The respondents seem to be a loyal group and have been working for their employers an average of 11 years, topped off by two

A profile of the typical communications manager

Type of college degree: **Bachelor of science in electrical engineering**

Number of years in the industry: **13**

Number of years with present company: **11**

Responsibilities: **Both voice and data**

Staff size: **27 people**

Salary in 1986: **$52,700**

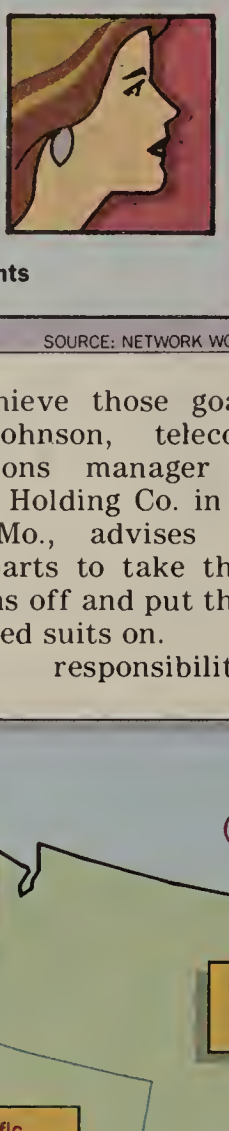
Projected salary in 1987: **$57,300**

Percent change from 1986: **9% increase**

Earnings breakdown: Straight salary: **98%** Bonus pay: **2%**

Corporate perks: **Profit sharing, stock options**

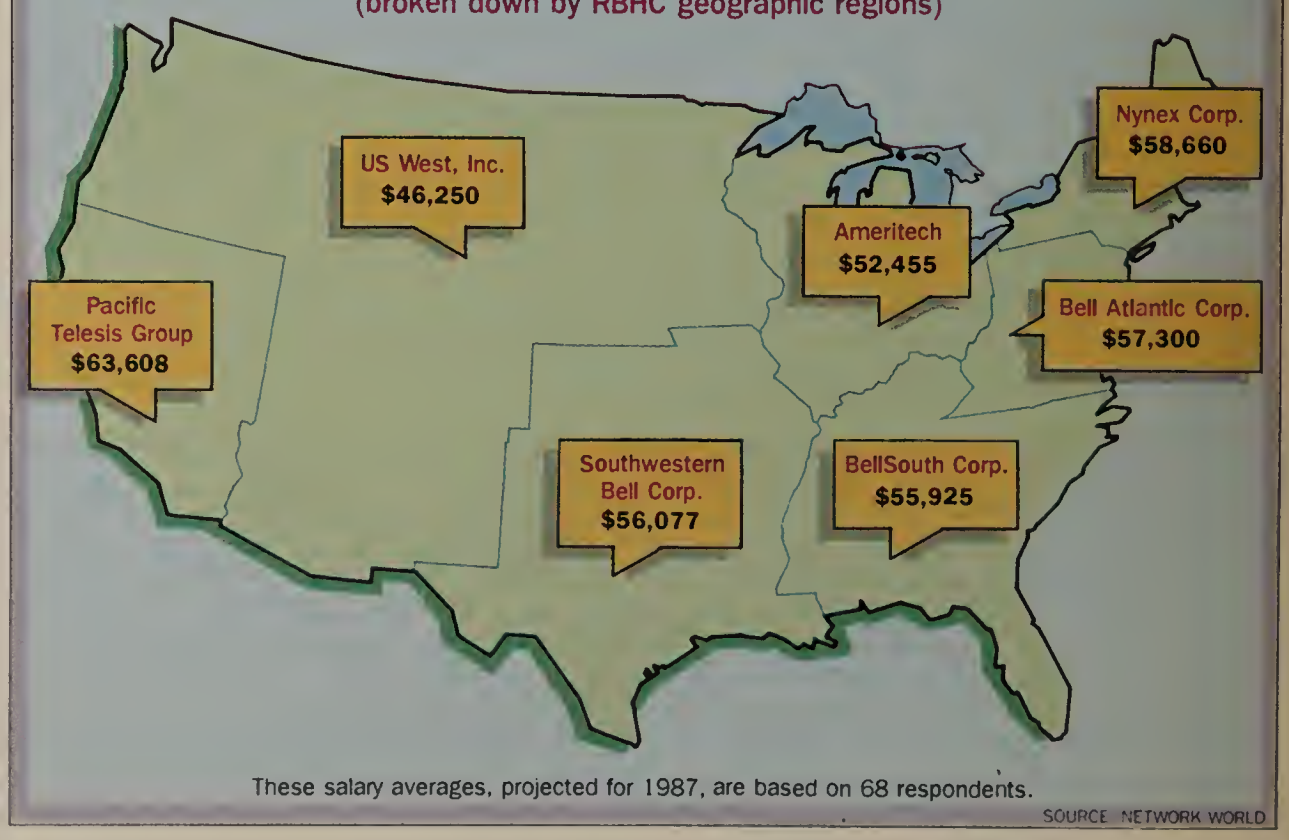
Suppiemental income: **Consulting, real estate investments**



SOURCE: NETWORK WORLD

Average salary of communications managers

(broken down by RBHC geographic regions)



These salary averages, projected for 1987, are based on 68 respondents.

SOURCE: NETWORK WORLD

managers who each have been at their companies for 37 years.

That average masks the game of musical chairs taking place as companies compete for the limited pool of experienced communications managers. An increasing number of managers are picking up their stakes and moving to other companies offering more money or more responsibilities.

More than 20% of the respondents have been with their companies for two years or less. Approximately a half-dozen managers contacted for the survey declined to take part since they were in the process of changing jobs.

Managers differ on the impact of job hopping. Del Monte's Rodgers says, "I don't think a communications manager should sit in a job for 10 to 15 years. My approach is to come in, take a look at the operation, put a plan in place to resolve problems and then move on to another company."

Victoria Blackford, vice-president of data communications at The Chase Manhattan Bank, N.A. in New York, counters, "Some managers think it is in vogue to move because you appear to be very valuable. I would not hire someone who shifts every year or two because I know I would be next in line."

An increasing number of managers are picking up their stakes and moving to other companies offering more money or more responsibilities.

Financial institutions, especially Wall Street firms, were pictured as the companies most actively courting new recruits. "I could easily double my salary if I wanted to move to work for a bank in New York," one manager claims.

However, managers at such firms paint a different picture. Timothy C. Hogan, network communications manager at Bank of New York, says compensation for communications managers on Wall Street is decreasing and perks are disappearing.

Another manager backs up that statement, noting that one particular employer cut back on pregnancy benefits and eliminated a profit-sharing plan.

Profit sharing is the most common perk managers receive. Stock options, educational expenses, reserved parking spaces, use of athletic facilities, expense accounts and half-price football and basketball tickets were other extra benefits. None of the benefits were given only to a communications manager; rather, they were part of overall corporate benefit packages.

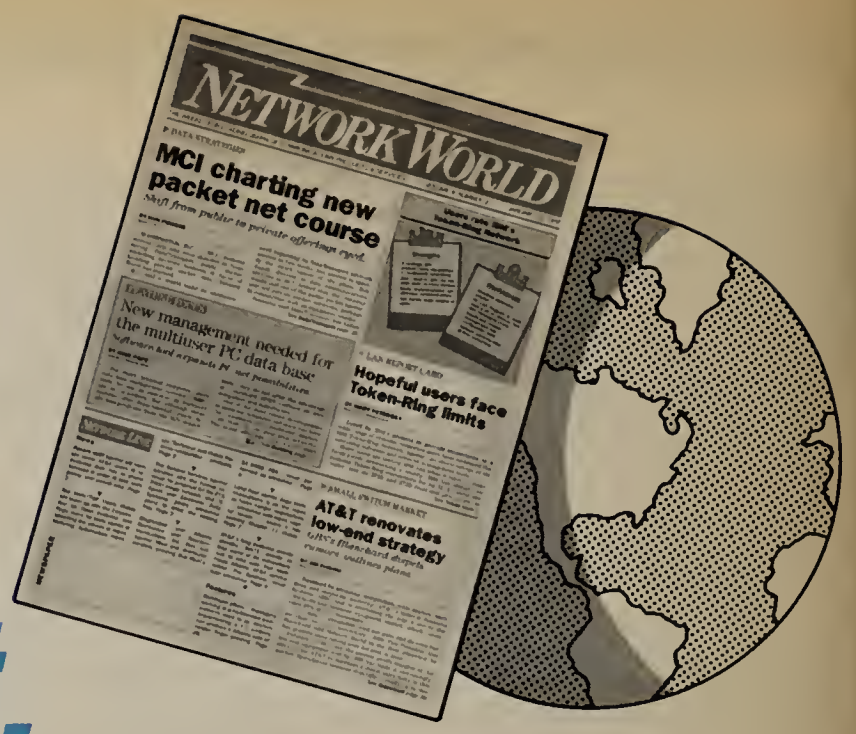
Salaries of female managers appeared to be lagging slightly in comparison with those of males. The average female manager's salary was $52,800, 5% lower than the average male's salary for similar work. However, females made up only 15% of the respondents, indicating they are not attracted to the communications field or they are not entrusted with management responsibilities.

Salaries of female managers appeared to be lagging slightly in comparison with those of males. The average female manager's salary was $52,800, 5% lower than the average male's salary for similar work.

One out of every five managers has a second source of income. A communications consulting business was the most common outside business. Extra income also comes from real estate investments, military retirement pay, software sales and ranch ownership.

One manager has an unusual method of ensuring a rosy future. Patrick Regan, manager of communications support at the Federal Reserve Bank in Philadelphia, recommends that communications managers buy state lottery tickets, which could make them instant millionaires.

As networking takes over the world, Network World takes over the market.



The trend has never been clearer. Networking is now the major application market for communications. And a recent statement by Ken Olsen, President and Founder of Digital Equipment Corporation, substantiates this trend: "We have to start thinking of the computers as peripherals. You start with the network, then you hang the computers on later."

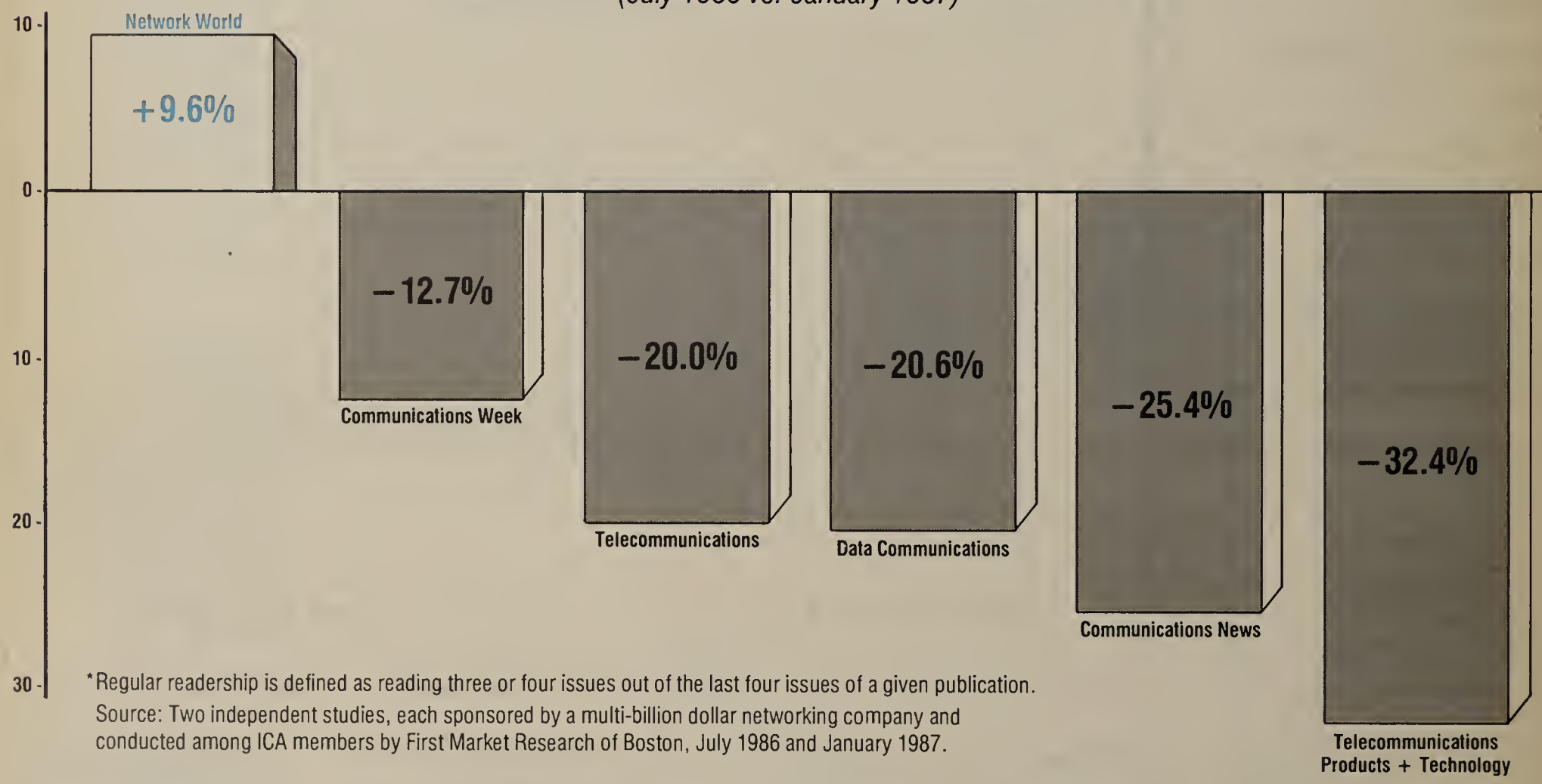
Networking. It's been *Network World's* focus from the very start. In fact, it is the *only* publication that covers the entire realm of communications from the networking point of view. And in doing so, *Network World* has established itself as the *standard* for communications users already networked or planning to network.

Today's users know they need up-to-date information in order to keep pace with the evolving world of networking. That's why they read *Network World.* And that's why *Network World* was the only publication to gain in regular readership in an independent study conducted among ICA (International Communications Association) members, some of the nation's most influential buying decision-makers for voice and data communications products and services.

The study, sponsored by a multi-billion dollar networking company and conducted in January 1987 by First Market Research of Boston, showed decreased readership of all communications oriented publications among ICA members since a previous study in July 1986. Only *Network World,* with its exclusive networking-oriented coverage, experienced an increase in regular readership. The percentage increase/decrease for each publication over that six-month period is displayed in the following chart.

Percentage Change in Regular Readership* among ICA Members

(July 1986 vs. January 1987)



*Regular readership is defined as reading three or four issues out of the last four issues of a given publication.

Source: Two independent studies, each sponsored by a multi-billion dollar networking company and conducted among ICA members by First Market Research of Boston, July 1986 and January 1987.

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Special Section: Communications careers

Which way is up?

Here's what it takes to ascend the typical communications department pecking order.

BY CANDY RODGERS
Special to Network World

Plotting a career strategy through the corporate communications hierarchy has all the complexities of navigating through a large city without a road map. Often, the intersections aren't clearly marked, and the road signs that do exist may not be pointing in the right direction.

To succeed, the aspiring communications manager must plan ahead by finding out where all the roads lead and what it takes to make it to each stop on the way to the chief information officer's (CIO) suite.

Today, data communications and integrated voice/data functions are usually found within the MIS or data processing organizations. Here, most communications applications are driven by information services and computer requirements, and personnel tend to be technical. In firms where voice and data are separate, voice and messaging services are usually found within the administrative services department. This department also includes functions such as facilities, human resources, security and operator services. Managers from this group tend to have generalist backgrounds.

Advancement in either department comes initially through attaining a breadth of technical knowledge and skills.

According to Joe Laudari, vice-president of MIS recruiting for search firm Sanderson Associates in San Francisco, many communications professionals traditionally have come from three areas: accounting, operations and radio communications in the U.S. armed services. Few communications managers have come from the vendor ranks because they're almost always too specialized for the job.

Many managers who have been in the industry for some time were Bell System installers, billing clerks and chief operators who assumed greater responsibilities over the years. Some have advanced to become administrative supervisors at customer service-oriented groups. For someone without communications experience or related education, the place to get started in large organizations is via the information services, administrative billing or facilities groups.

Today, however, such a background is not enough to advance into management. Persons in these positions tend only to understand the technology at a shallow level. To continue to move up, these persons must augment their experi-

Continued on next page

Rodgers is corporate communications manager at Del Monte USA in San Francisco. Her career has included positions at Rochester Telephone Corp., Pacific Telephone Co. and Apple Computer, Inc. She is also president of Protel, an association for telecommunications professionals.

From previous page
ence by acquiring more technical knowledge.

Another way to enter the communications management field is to begin from the technical side. Typically, a person starting up the technical ladder may work at the customer services help desk or troubleshoot voice or data systems. These persons tend to be technical and narrowly focused and must round out their backgrounds with more administrative- and management-oriented experience.

Communications ascendancy varies with the structure of the organization. The following section lists a typical hierarchy within a large company that has integrated voice and data under one department. In some companies, similar positions may have different titles, and in smaller companies, some positions may be combined. Salary ranges are given as estimates (see "*Network World*'s annual salary survey" on page 25 for more comprehensive data). In most cases, responsibilities will follow this order.

Junior communications analyst

At the entry level, the communications analyst moves through three grade levels: junior communications analyst, communications analyst and senior analyst. During this time, the job description stays the same, but responsibilities increase.

Junior analysts usually move up from communications-related positions such as the help desk, installation or information services. They cross into this position by becoming involved in communications-related projects. The emphasis at this level is on developing technical skills.

Junior analysts make from $24,000 to $28,000 per year and report to an assistant manager, network supervisor or project manager. Their responsibilities include analyzing user requirements for equipment and services and developing minor project proposals, which are usually single-site applications. Junior analysts also do some user training on smaller systems and act as vendor liaisons. A typical project might be installing a small hybrid telephone system.

Communications analyst/technician

The communications analyst, or communications technician, has essentially the same job description as the junior analyst. The salary moves up to between $26,000 and $30,000.

In addition to responsibility for project implementations and vendor interaction, the communications analyst might also be involved in some design work. He may manage the implementation of larger systems or be responsible for smaller ones. Responsibilities may also include managing a communications data base, billing analysis or servicing a data system.

Senior analyst/technician

The senior analyst, or senior technician, retains the same job description as the previous two levels, but responsibilities increase and salary increases to between $28,000 and $34,000. Inexperienced graduates with telecommunications degrees often are hired into this position.

Senior analysts are expected to manage more complex systems. Duties may include planning system moves and evaluating hardware and software, as well as implementing assigned projects. Analysts at this level are also responsible for the day-to-day management of communications operations and are involved in coordinating meetings with vendor sales teams. They may also assist in writing requests for proposal. A typical project would be to install a small private branch exchange of 120 stations or less.

Junior analysts usually move up from communications-related positions such as the help desk, installation or information services.

Senior analysts are expected to manage more complex systems. Duties may include planning system moves and evaluating hardware.

Entry-level management

After four to six years' experience, the aspiring manager has a feel for the communications organization as a whole and is ready to become a manager. Typical titles include network supervisor, communications supervisor, technical supervisor, project manager and chief operator.

To move into this entry-level management position, the senior analyst must have worked with a variety of systems and have a good technical background. The entry-level manager works on building management and business skills and must understand how systems affect the corporate bottom line.

The position involves supervision of nonmanagement personnel and usually reports to the communications manager. Salary is between $40,000 and $46,000. Entry-level managers support and upgrade in-place systems and do some systems report generation. They also examine systems requirements and make recommendations between alternatives. For example, a manager might analyze the benefits of switching from AT&T to MCI Communications Corp. as a long-haul service provider and then make a recommendation.

This person is responsible for writing RFPs and would oversee more important projects, such as the cutover to a large PBX.

Some managers who are eager for higher earnings will move into engineering or to a vendor's sales or customer service department. After as little as two years, some managers will move to the next level.

Lower to middle management

By this time, most managers have six to 10 years' experience and have made a commitment to a career path in communications management. Managers at this level are called assistant managers, senior project managers or corporate consultants. They report to the communications manager and supervise systems and management personnel.

These managers are also actively involved in the recommendation and selection process and are expected to write RFPs and requests for information and make presentations to senior management. They do much of the support work involved in managing the planning, design, cost-justification and implementation of communications systems. Responsibility extends to projects with a scope of $750,000 to $1 million.

Salaries range from $44,000 to $52,000. Supervising lower level management personnel is the toughest challenge for these managers. Unlike technical responsibilities, there are no clear paths to take when it comes to managing people, and in some companies, matrix management makes the job even tougher.

Mid-level management is a make-or-break situation for aspiring managers. Those who lack either adequate technical knowledge or good management skills will not advance further.

Mid-level managers must be able to interact with other managers at all levels, including acting as a consultant to senior managers in different groups. To get ahead, these managers gain visibility by taking on speaking engagements at functions such as users group meetings and by writing for and being quoted in trade press and other publications.

Communications manager

With 10 to 15 years of accumulated experience, the communications manager can give directions based on his own knowledge of a wide variety of technical and management areas.

The communications manager reports to the director of telecommunications, a vice-president or other executive. Depending upon the size of the organization, this may be a middle or upper management position.

Communications manager positions are usually filled by someone who has moved up the ladder, and they command $50,000 to $70,000 salaries. Persons with both a masters of science in electrical engineering (MSEE) and an MBA are preferred. Many communications managers also have a working knowledge of financial analysis.

Emphasis is placed on managing the network as a whole. Responsibilities include budgeting, strategic planning and managing, developing, designing, cost-justifying and implementing communications projects of $1 million and up.

Communications managers are involved in tasks such as negotiating variable pricing arrangements and national accounts plans with vendors. They might also lay the groundwork for establishing a software-defined network. Actual implementation would be assigned to project managers.

The communications manager's work is highly visible; his decisions affect both users and the bottom line. He must be adept at prioritizing and must constantly develop and revise plans to reflect changing organizational priorities. He must also keep his boss and other senior managers up to date.

Many communications managers may stay in this position for the duration of their careers. Communications managers who advance further develop a good management style and maintain a high profile within the organization. These managers also broaden their knowledge by branching out into related fields such as systems programming.

The communications manager's work is highly visible; his decisions affect both users and the bottom line. He must be adept at prioritizing.

Director of communications

The main difference between a communications manager and a director is the size of their budgets. The director of communications re-

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▶ *TELECOMMUTING*

The electronic commute

A growing number of employees are saying good-bye to life in the fast lane.

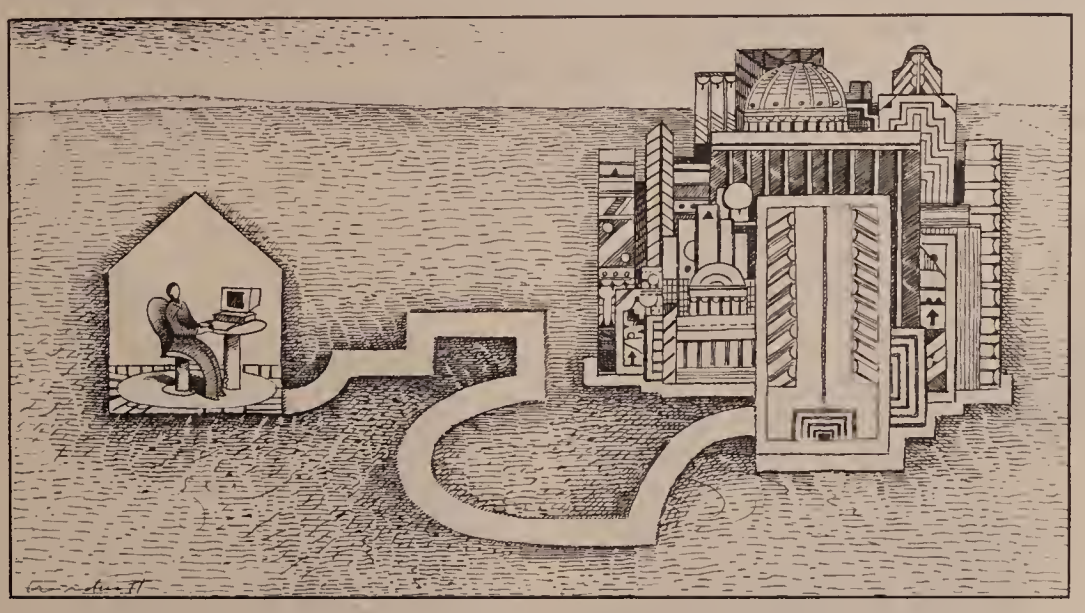
BY ELLEN FALBOWSKI
Special to Network World

Is telecommuting — salaried employees working at home and communicating with the office via computer — the answer to crowded offices, parking problems and a changing labor pool? To a growing number of employers, the answer is a qualified yes.

The actual telecommuting population in U.S. business is not known, and estimates vary widely. Gil Gordon, president of Gil Gordon Associates, a telecommuting consulting firm in Monmouth Junction, N.J., offers a conservative estimate of 10,000 telecommuters in 350 companies nationwide. By contrast, a 1986 national work-at-home survey by New York-based consultants Electronic Services Unlimited produced an estimated 120,000 corporate-employed telecommuters.

One reason for this wide variance in numbers is that telecommuting is still not officially recognized or sanctioned by most major companies. Most telecommuters retain their office positions; they simply begin performing their work from a remote location, usually from home.

The decision to allow telecommuting is typically made at the supervisory level, according to telecommuters interviewed for this article. Higher level company officials are often not consulted or don't get involved in the decision making. As one telecommuter says, "Once telecommuting becomes 'official,' they're afraid they'll have to let everyone do it."



Gil Gordon identifies three requirements for successful telecommuting: the right job, the right employee and the right manager.

He explains that the job must include tasks with measurable beginning and end points. It must provide access to all resources needed to do the work and not require frequent face-to-face contact.

The employee need not be a hermit but must be self-directed and self-motivated, possess basic job skills and be able to work alone without being overwhelmed by a sense of isolation. The manager, in turn, must be able to set realistic goals and know when the job is done correctly.

Telecommuting under the umbrella

More companies are beginning formal experiments with telecommuting. One such company is Travelers Insurance Co., which in 1986 began a two-part telecommuting pilot program designed to serve as a company model.

In the first part, managers and officers are encouraged to increase their productivity by performing "thinking" tasks such as reading, writing and analysis at home, away from office distractions.

The second, more radical, part is the actual implementation of telecommuting. The current project consists of Travelers' programmer/analysts, who work from home 4½ days and come into the office half a day a week. Except for these three "core" office hours, the programmer/analysts set their own schedules.

Continued on next page

Falbowski is a free-lance writer based in Haddam, Conn.

ILLUSTRATION ©1987 JIM ENDICOTT

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At home, they are able to work evenings and weekends to get better computer response time and avoid prime-time processing delays and other problems. The company saves on office space because these workers have no workstations in the office. Their half days in the office are spent in meetings with customers, supervisors and a telecommuting support group.

Frank Collins, second vice-president of data processing at Travelers, identified several technological advances — voice messaging, electronic mail and the proliferation of personal computers as workstations — that have reduced the need for daily face-to-face contact in some areas of business.

Equally important for the company has been the development of a managerial style that allows supervisors to feel confident about managing remotely located employees. Telecommuting employees are treated the same as other employees, receive the same benefits and are eligible for the same raises and promotions.

"The crucial element for a company considering telecommuting is to do its homework before starting the program," says Michael Crampton, director of data processing for Travelers.

He says the company ensured the success of its program by choosing a group of jobs that could be remotely managed, training a top-notch manager and using open posting procedures to select the best available candidates.

The manager and future telecommuters participate in training seminars and discuss how they will handle communications and time management. Together, they set job objectives that are formally reviewed quarterly and informally reviewed as often as needed. Telecommuters also use written texts and computer-based education to reinforce the seminar training.

For now, telecommuting jobs are only being offered to current Travelers employees. According to company officials, the next step may be to use telecommuting as a recruiting tool in areas where employers must be competitive to attract workers.

At other companies, telecommuting can be less formal. Marti Kalar has performed part-time voice telecommunications analysis for Aetna Life and Casualty Co. from her home since 1974.

Her 25-hour week includes one day in the office, although she is also available for meetings when necessary. Over the past 13 years, she has had six supervisors, each of whom expressed initial discomfort with her schedule but grew to appreciate her productivity.

Gail Sheflott, Aetna's director of Information Systems Operations, telecommutes two days per week and is in her office for the other three days. To make the telecommuting as transparent as possible, Sheflott has an off-premises extension at home with the same number as her office telephone.

Other Aetna employees spend productive time at home as needed to avoid office distractions or bad weather.

Labor relations

Not everyone is a telecommuting enthusiast. In 1983, the American Federation of Labor and Congress of Industrial Organizations (AFL-CIO) called for a ban on electronic homework. Dennis Chammot, associate director of the AFL-CIO Department for Professional Employees, explains that under the Fair Labor Standards Act, professional and executive employees would be exempt from the ban.

The AFL-CIO is more concerned with clerical employees, who traditionally have less bargaining power and less control over the work itself and thus are more vulnerable to exploitation than professional employees. Chammot cites several potential problems

that could result from a company treating its telecommuting clerical workers differently from other employees.

"When telecommuting clerical workers are measured and paid by piecework, they are not compensated for related tasks such as set-up time, correcting their work, picking up new assignments and dropping off completed work," Chammot explains.

"So their hourly pay may be lower than that of other employees doing the same work in the office. They may even earn less than the minimum wage. They may not receive benefits such as health care and paid breaks.

"Some companies are shifting the cost of equipment to the telecommuter," he continues. "Secretaries in offices don't have to pay for the typewriters or word processors they use." In the home, he said, "the workload may be high enough that other family members help out, possibly violating child labor laws." Chammot says he believes regulating telecommuting would prove unworkable.

Companies that call their telecommuters "independent contractors" — thus avoiding such employer costs as health insurance, pay for sick time and vacation time, unemployment insurance and social security — may be courting legal problems. A group of at-home workers in California are suing their employer for the benefits their office counterparts receive.

While Gil Gordon agrees that the nature of clerical work makes exploitation of clerical workers more likely, he suggests that "today's workers are pretty smart — they know when they're getting a bad deal."

Related questions remain. Recent tax rulings suggest that telecommuters may not be allowed to take business depreciation deductions on their houses if they also use business space at the office.

Employers worry about their liability should anyone become injured in a telecommuter's home.

Residential zoning restrictions differ. Ergonomic decisions such as lighting and seating are made for office employees but are usually not made for telecommuters, possibly resulting in unnecessary eyestrain and backaches.

Advances or declines

Rapid technological advances are finding their way into telecommuting. Error-correction protocols such as Microcom Network Protocol and X.PC can ensure error-free delivery of file transfers.

Dial-up security measures, such as encryption and call-back devices, can protect sensitive information and keep out electronic intruders. Long-distance data communications charges can often be reduced by using a value-added network rather than standard telephone company offerings.

For example, Tymnet/McDonnell Douglas Network Systems Co.'s hourly dial-up rate of approximately $4.50 compares favorably with the $15 and higher per-hour charges for AT&T's toll-free 800 services.

Gil Gordon mentions portable facsimile machines and automatic call distributor upgrades as the latest new technologies to arrive at home, and dial-up videoconferencing may not be far behind. However, telecommuting will still be limited by the level of technology in the office.

Despite all the technological progress, social barriers to telecommuting are still strong. Telecommuters may not be taken seriously by coworkers who "don't want to bother you at home." Long-term telecommuters often find that lack of visibility affects their chances for promotions.

Since most telecommuting is performed by existing employees, would-be telecommuters whose employers do not offer the option of at-home work are not likely to find it elsewhere. This also tends to keep telecommuters bound to their current jobs.

The Association of Electronic Cottagers in Davis, Calif., offers several services, including an electronic bulletin board. Telecommuters use the bulletin board to communicate information about themselves, but the service does not currently act as a clearinghouse for jobs or contracts. Also, professional recruiters do not yet broker telecommuting jobs.

As a number of companies have learned, with the right combination of job, employee and manager, telecommuting can increase productivity, reduce requirements for office space and parking, provide longer hours of service and better utilization of computer resources, and offer flexible options to attract and retain valuable employees.

Growth is likely to be slow and steady as businesses try it out. Over time, the legal, technical and social implications will be better understood. In the meantime, telecommuting employees will continue to be the exception rather than the rule.

Despite all the technological progress, social barriers to telecommuting are still strong.

Which way is up?

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ports to a corporate officer and is usually found in large organizations where more than 10% of operating expenses are communications-related. Examples include the airline industry, marketing companies and communications companies.

A director of communications is usually a former communications manager who holds an MBA and an MSEE. Salary for this position ranges from $60,000 to $80,000 per year. The director of communications makes all final decisions for new projects, manages senior staff, reviews the capacity and performance of equipment, and develops departmental procedures and policies.

Directors focus on strategic planning for the company's global operations, supervise communications managers and are the primary liaisons between the communications department and rest of the organization.

This position requires a moderate amount of technical ability and a strong orientation toward supporting corporate business objectives. A director usually has 10 to 20 years of experience. Communications managers find few opportunities to advance to this level because few companies are large enough to need a communications director.

Chief information officer

Even fewer corporations have large enough communications requirements to warrant hiring a chief information officer (CIO). A relatively new position, the CIO usually has a master's degree in computer science and business, with a background in computer research and development and accounting.

CIOs report directly to the company president and earn $80,000 to $90,000 per year. They are concerned with global projects, such as integrating or moving corporate data centers.

While many MIS and DP managers often move into this position, CIOs rarely come up through the ranks of the communications organization. Such candidates are considered to be too technical and lacking the managerial skills necessary to ascend to top management.

This may be changing, however, as more communications managers broaden their experience and qualifications in preparation for an assault on the CIO suite. Communications managers and directors that have made it have usually continued their education by completing an MBA program and by obtaining an advanced degree in computer science.

Getting ahead

Managers on their way up are better off moving between a variety of jobs in several companies or subsidiaries. Because rapid growth in communications organizations is outstripping the supply of communications professionals, aspiring communications managers will find that opportunities for advancement and for higher salaries will come from without as well as within.

Most managers should make at least three such moves to gain exposure in the areas of data base administration, technical development, applications design and telecommunications. With each move, salary increases range from 10% to 20%, with moves between companies on the higher end of the scale.

In any management position, it is usually those with a strong generalist background who advance. The narrowly focused technical or engineering person may lack the interpersonal skills necessary for the transition to management.

On the other hand, without good technical training, today's manager would be lost. Says Gay Carter, technical recruiter for Data-Tec Personnel Recruiting Service in San Francisco, "Six years ago, no one had BSEE degrees in the communications field. Today, 20% of all openings demand it. These days, it's necessary to have an engineering mind. Systems Network Architecture could be picked up, but the ability to design networks with T-1, multiplexers, multipoint lines and the ability to work within tariffs is essential."

What's the right background mix — voice or data? Carter says that, over the last two years, requirements have changed from voice or data qualifications to voice and data and back again. But, Carter says, "The real force driving the management of systems is having abilities in a variety of disciplines," including voice and data.

Education counts

Many of today's communications managers moved through the ranks without any type of college degree, or with a degree in an unrelated field.

Today, however, a technical degree is becoming essential. While most managers are looking for people with at least some experience, inexperienced graduates of college telecommunications programs can move into entry-level communications positions as junior communications analysts. These persons usually start off at a higher level and move in an accelerated program of advancement.

However, "The real education," says Sanderson Associates' Laudari, "is when they are out the door and starting their first jobs." Persons considering full-time study should consider setting up a summer internship or cooperative work/study with a user, vendor or government organization.

Essential experience

For more seasoned managers aspiring to top management, enrollment in an MBA program is essential. MBA programs with an emphasis on communications are springing up everywhere, and many schools offer part-time programs with extremely flexible schedules. Only with the right combination of education and experience can communications managers take that last step into top management.

Letters:

Editor:

In the May 11 issue of *Network World*, it was stated that the talk of benefits from very small aperture terminal networks has been reduced to a whisper this year ("VSAT nets: Is the thrill really gone?" *NW*, May 11). We at Burlington Coat Factory Warehouse Corp., mentioned in the article as a user of such a network, wish to give a resounding shout of approval for the network we installed last year. By installing a network of VSATs in our 91 store locations, we have reaped a number of significant benefits, the least of which is a daily savings of about $1,000 in communications costs.

Burlington Coat's retail store locations have had on-line access to our mainframe computer for over 10 years now. Until last year, that access was primarily through public packet networks. Each store had multiple asynchronous modems to dial into the local node of the closest public packet network.

Over the connections, the stores would transmit locally generated point-of-sale (POS) detail, back-office receiving and other inventory transaction batches and electronic mail. To obtain favorable pricing, we shifted much of the traffic to nighttime, but even so, our per-location network costs were between $400 and $1,200 per month, excluding the cost of the phone calls to the network. Burlington Coat does full POS authorization of charge card sales, and this traffic was also handled through the dial-up network generating significant phone costs in areas with measured business service.

In October 1985, we first met with Equatorial Communications Co. By July 1986, we were piloting the 60 locations that we requested in time for our busy season. The rest of the locations will be fully installed before the end of June, as will all new stores after that.

The specific benefits that drove our decision to go with Equatorial were:

- Increased reliability of service.
- Full-time X.25 two-way communications with each store.
- Reduced credit card authorization time.
- Vendor-provided network management.
- Low start-up cost.
- Low ongoing cost.

We have achieved all of these desired benefits.

Equatorial, from its impressive network control facility, provides full network management. This includes initial site licensing, landlord negotiation assistance, site preparation and installation, and ongoing site monitoring. If a problem does develop, it is more often Equatorial that notifies us than the other way around.

The average time to obtain a POS credit card authorization has dropped from about 35 seconds to about seven seconds. This dramatic improvement could, in itself, justify the network in terms of customer satisfaction. The number of times an authorization is not available due to communications problems has dropped from over 10% to about 2%. This, combined with the lower cost X.25 connection to the authorization network, enabled us to negotiate a significant reduction in the discount rate charged to us by the bank.

By employing an X.25 PAD in front of the Equatorial equipment at a site, and because of the full-time availability of the network to the site, we have opened up a whole new set of applications. These include the ability to remotely diagnose problems and to initiate automated updates to store files and programs late at night with no store intervention.

Finally, as stated earlier, these benefits are achieved with a savings in communications costs that covers the initial installation costs of a location in less than six months! From then on, the savings go straight to the bottom line.

So, far from being unhappy with our experience, Burlington Coat is delighted with the performance and cost of our Equatorial-provided VSAT network. Frankly, we are surprised that more people with wide geographic communications requirements such as ours have not embraced the technology.

Percy S. Young III
Manager of systems
and communications
Burlington Coat Factory
Warehouse Corp.

Editor:

Your May 11 issue features a piece entitled, "Analyzing LAN analyzers," which I feel missed the mark on two matters. First, the article apparently was researched before the introduction of an Ethernet protocol analyzer by Network General Corp., which offers different features from the units discussed.

Secondly, although Ethernet is very popular, it is certainly not the only local-area network in town. Network General provides analysis and diagnostic equipment for the IBM Token-Ring and ARCnet network systems that might interest your readers. Within one month of introduction, our Dual-LAN (Ethernet and Token-Ring) model was our most popular configuration, which attests to the broad support for these complementary technologies.

Harry J. Saal, president
Network General Corp.

Banks weigh COS pitch

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pend on proof that membership can directly contribute to their bank's bottom line.

"If they could show me some tangible benefits they have come out with, such as where they actually have helped develop some products compatible with one another or developed a service for a special need within the banking industry, and I could show that money spent now is going to save me more money over the course of a couple years, then I might be able to okay it," said Fred Hardy, manager of network planning at Riggs National Bank in Washington, D.C.

Jeff Newbury, vice-president for information services at First Wisconsin, said he liked the idea of participating in the standards effort, but contribution to the bank's profit would be the deciding factor in whether or not to join COS. "We would like to play a role in the setting of standards, but I'm not sure if that would gain us enough to warrant the cost," he said.

Communications officials at Chase Manhattan said they have already considered joining COS. According to Burns Darcy, a second vice-president in the bank's technical services division, Chase Manhattan views the manpower contribution the more daunting part of joining COS.

"Even for the rather minimal price of joining COS, we would still have to put in a rather substantial effort in terms of people to contribute for projects, monitoring projects and so on," he said. "So we would have the up-front cost of joining, and we would also have the cost of providing people to participate in projects and meetings, and simply to monitor the COS activities."

Chase Manhattan's Robert Craig, vice-president for network planning, said, "Those of us who understand what COS is all about believe that Chase should become a member. However, our senior management has not been convinced it is worthwhile. To be blunt, it's the price."

Darcy said Chase Manhattan is more concerned with applications than with the underlying technology. "With our orientation toward being end users of technologies — in other words, buying off-the-shelf sorts of stuff — plus the time and expense involved in the activities, we didn't see that there was a direct benefit in participating," he said.

Darcy said Chase Manhattan saw three potential benefits of joining COS: participation in setting direction of vendor technology development; the ability to use COS test-bed facilities; and the advantage afforded by publications relating to Open Systems Interconnect.

Since the first benefit would be afforded to all banks, Chase Manhattan saw no direct and specific benefit for itself there. The ability to use COS test beds is not significant, Darcy said, since as a user, the bank can look for products that vendors have themselves certified at COS or another test bed, such as the National Bureau of Standards or the Industrial Technology Institute.

Asked why banks would want to join COS, Manakas said, "The consideration is simply understanding how open systems interconnection affects their bottom line and what the difference is between an open systems configuration and the proprietary networks and machines that they have."

COS offers three categories of membership: regular member at $25,000 per year, research member at $50,000 per year and senior research member at $200,000. The amount research members pay beyond the $25,000 basic membership fee is used for research and development.

Novell, CXI bolster LAN links

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tem/2s to access up to 40 concurrent mainframe sessions via a single coaxial port. The board can be connected directly to the 3299 interface of an IBM 3274 or 3174 cluster controller. The PCOX/COAX-MUX works in conjunction with new PCOX/GW-3270 server software. The board and software are priced at $1,100.

To access the gateway, individual IBM workstations on the network must run terminal-emulation software. CXI introduced five such software packages last week, due for delivery in July. PCOX/ONE, priced at $150, provides IBM 3278 and 3279 terminal emulation with one host and one MS-DOS or PC-DOS session.

PCOX/TWO, priced at $200 for the network version, can run a personal computer printer that emulates an IBM 3287 printer.

The stand-alone version of PCOX/TWO, also introduced last week, is priced at $400.

Slated for release in June, the single-user version supports coaxial boards from CXI, IBM, Digital Communications Associates, Inc. and AST Research, Inc. In lieu of a printer and host session, users can run a printer and MS-DOS or PC-DOS session. This software package is available for Synchronous Data Link Control and Binary Synchronous Communications environments.

The network workstation version of PCOX/MULTI software provides five concurrent host sessions, which can be configured as one DOS session and four printer sessions. It is priced at $275.

PCOX/ONE-APA, priced at $295, provides network users with all of the functions of an IBM 3179G color graphics display terminal. It provides one host session and one DOS session. PCOX/MULTI-APA lets users run up to four 3278 or 3279 displays or 3287 printer sessions along with one APA graphics host session. It is priced at $395.

NET augments T-1 mux line

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The products conform to D4 and Extended Super Framing, which are telephone company T-1 standards. They also support DS1 level formatting, which specifies how 1.54M bit/sec T-1 facilities are segmented into 24 64K bit/sec channels, and DS0 level formatting, which enables customers to drop off 64K bit/sec channels from a composite link.

The IDNX 20 is housed in a smaller cabinet than other IDNX models and has a maximum of 12 card slots. The product can support a maximum of eight T-1 lines, 192 voice circuits or 36 data circuits, which can range in speed from 1,200 to 56K bit/sec. For example, the device could be configured to support two T-1 lines, an interface to a private branch exchange, 48 voice circuits and 20 data circuits.

Unlike the other units, the IDNX 20 is based on a single integrated circuit board that includes a CPU, time slot interchange and clock, items that were previously housed on separate pieces of equipment.

Voice and data line cards are compatible across the IDNX product line. These include voice line cards based on pulse code modulation and others that support adaptive differential pulse code modulation. In addition, the product can be used with NET's recently announced INCS/500 network management system and INCS/Alert Monitor, the company's link to IBM's NetView network management system.

Analysts view the new product as a natural attempt by NET to capture a larger piece of the growing T-1 multiplexer market. "NET's products were not geared toward and cost-effective for users with small networks," noted Andy Schopick, vice-president at Gartner Securities Corp., a financial analysis company in Stamford, Conn.

When compared with the $40,000 price of the IDNX 40, the $25,000 IDNX 20 gives NET a lower entry-level cost. Despite the reduction, analysts deemed NET's products pricey. Lloyd E. Collins, director of product marketing at NET, admitted that the IDNX 20 was priced higher than competitive products but claimed customers would be willing to pay extra for the product's advanced features.

Customers will have to wait until late in the fourth quarter for production shipments of the product, a delay that analysts said could hurt. "Customers have plenty of alternatives to the IDNX 20," Schopick said.

The new product is geared toward two sets of customers, according to Collins. Customers with large networks may station the multiplexer at remote sites feeding into a backbone network based on the larger IDNX 40 and 70. Collins said one customer has ordered 40 IDNX 20s for its network.

The IDNX also expands NET's reach to a second set of customers — small and medium-sized companies. Since its inception, the company has concentrated its sales efforts on the Fortune 500 companies. Schopick claimed that the mid-range represents the largest slice of the T-1 multiplexer market. Later this month, Timeplex is expected to respond to NET's challenge in its primary market segment by announcing the Link/100, a multiplexer aimed at the high end of the market.

Jack Musgrove, associate director at Dataquest, Inc., a market research firm in San Jose, Calif., said Net's low-end T-1 multiplexers will also pressure General DataComm, Industries, Inc., Avanti Communications Corp. and Digital Communications Associates, Inc. Analysts agreed the product would not affect point-to-point vendors, such as Coastcom, Tau-tron, Inc., Aydin Monitor Systems Division and Granger Associates, Inc.

Recently, reports of an OEM arrangement between NET and IBM surfaced. Collins denied NET reached any agreement with IBM and said the company is talking with a number of companies about a variety of distribution deals.

IBM's 3174 blossoms

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Communications Network Architects, Inc., a Washington, D.C. consulting firm, said, "Customers see the 3174 as a bridging product. Terminals are slowly being replaced by microcomputers, and corporations need a device to support both types of devices."

Acceptance is expected to swell in the coming months, as IBM starts volume shipments of two models that provide connectivity to the company's Token-Ring Network. Dzubeck noted, "The IBM Token-Ring eventually will connect every microcomputer within a building, and the controller provides the micros with a gateway out to larger IBM systems."

Ed Scharmer, IBM's product manager for display controllers, said customers are interested in the Token-Ring models. "We have an on-line system that support members use to answer customers' questions," he said. "There are approximately 400 questions currently on the system, and more than 50 are related to models for the Token-Ring."

The Token-Ring-compatible models also offer communications managers a chance to cut operating costs. A manager at a large financial services company, who asked not to be named, said he recently compared the cost of using the Token-Ring-compatible 3174 with other local network gateway options. He found the IBM approach — which included the controller, an attachment to the Token-Ring Network and terminal emulation software — costs 11% less.

The gateway features position the 3174 controller against a new array of competititive products, such as communications boards. "Communications board manufacturers, software vendors and local-area network companies all view the product as a threat," noted Smith Barney's Goldman.

The device has extra capacity that could support other communications functions. "Currently, four card slots out of 17 are being used on the 3174," IBM's Scharmer explained. "There is a lot of room for expansion, and we plan to use it."

The slots could equip the 3174 with features competitors currently offer. For example, a 3174 user can communicate with only one IBM host. "We recognize some users have a requirement to attach to two IBM hosts," Scharmer said.

Analysts have speculated about other capabilities that IBM may add. "As we move into intelligent device-to-device communications, there are services that could be placed on the controller," Scharmer said. "For example, we have downstream load capabilities for diskless devices and will continue to expand such offerings."

"However, we do not want to infringe on our small systems products," the product manager continued. He said IBM would only add features, such as storing keyboard tables on the controller, that would not require customers to hire additional support personnel. The company will not add sophisticated functions, such as comprehensive file server capabilities.

The new line of controllers has pressured traditional competitors, to revamp their product lines. "Competitors were surprised because IBM priced its products so competitively," Goldman said. The pressure will increase later this year as IBM begins to ship models of the 3174 that connect to asynchronous terminals and hosts. That could hurt companies such as Lee Data Corp., which made inroads into IBM accounts by offering a similar feature.

Goldman said competitors are trying to move into new markets to lessen their dependence on controller sales, and many plan to announce new products such as diskless workstations by the end of the year. She said controller vendors may try to take on the role of systems integrators. Goldman added that local network sellers and board companies may be interested in signing OEM agreements with controller suppliers, and she said such deals could help those suppliers expand their product lines and increase revenues.

DG widens offerings

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tablish connections and exchange data. The company also unveiled personal computer interface cards for Ethernet networks and the company's DG/Starlan network. DG also introduced a networked version of its CEOwrite word processing software and support for Microsoft Corp.'s MS-NET networking software. In addition, DG uncloaked an IBM Professional Office System (PROFS) interface called the CEO PROFS Exchange Architecture (CEO PXA).

The software allows CEO, DG's MV-based office software, to exchange documents and electronic mail with IBM mainframes running PROFS. DG introduced a DISOSS interface for CEO in 1985.

Because PROFS runs on the IBM's new 9370 processor, the PROFS gateway is especially significant, according to Andrea Rossi, president of Rossi Consultants, Inc., a small systems consultancy in Austin, Texas.

"If the 9370 is truly going to be IBM's department architecture, then those other departmental vendors have to access PROFS networks," she said.

DG's manager of communications systems and networking, Joe Forgione, explained, "Data General's strategy is to be able to tie all three levels of computing together into a single integrated network. That includes local-area networks, wide-area networks, distributed applications and possibly other areas, such as voice. An additional part of the strategy is that we believe in multivendor networks and will integrate multivendor networks."

DG's interface software, designated the Workstation Transport System (WTS), runs on MS-DOS-based personal computers in a network and allows network nodes to access applications on other nodes. The software also works with DG's MV-based Xodiac Transport System to provide virtual terminal emulation capabilities to Personal Computers.

As part of DG/PC*I, the company is now offering users a choice of three personal computer local networks, including DG/StarLAN, Thin Ethernet and Ethernet, all of which meet the Ethernet standard set in IEEE 802.3. The local networks can link personal computers directly to DG minis, which function as print, file and communications servers.

Beta-testing of the new networking products has already taken place at three user sites, according to DG. The Federal Reserve Bank of New York, the Chicago Research & Trading Group and a Los Angeles-based law firm were the three users.

Along with an enhanced version of CEOwrite, DG's MS-DOS-based word processing program, the company introduced CEOwrite Network, a utility that allows users to employ CEOwrite on a network.

Westboro, Mass.-based DG's new DG/PC*I Service group is designed to help users with network planning and design, and network installation management. It also offers consulting and education services and maintenance contracts for IBM Personal Computers and other widely used peripherals and option cards.

CEO PXA is priced from $5,250 to $10,500, depending on MV model. CEOwrite Network is priced at $375. WTS is priced at $150.

EDI competitive edge

continued from page 1

This technology is commonly referred to as Electronic Data Interchange (EDI), which is defined as the computer-to-computer exchange of standard-formatted business information. In theory, EDI will enable companies to eliminate paper-based order entry and billing practices by standardizing the networking methods used to exchange specially formatted business documents.

But in practice, there are no accepted standards for EDI transactions, and pioneers have been forced to make hard choices in setting up their networks. The ANSI is working on a standard — ANSI X.12, which includes specifications detailing document form and content — that may facilitate implementation of EDI, but it is still incomplete.

Vertical market standards

In the absence of industrywide standards for EDI transactions, companies in vertical markets have created their own standards. These standards allow members of specific industries, such as the pharmaceutical, grocery, automotive, transportation and apparel industries, to communicate with others in their businesses. But, the completion of ANSI X.12 would facilitate cross-industry communications.

Companies such as Bergen Brunswig Corp. and grocery retailer Super Valu Stores, Inc. have already constructed EDI networks based on vertical market standards, instead of waiting for the ANSI X.12 standard.

The National Wholesale Druggist Association (NWDA) has rallied around Fixed Record Length, which establishes common criteria for creating documents, while the nation's grocery industry, which includes such users as Super Valu Stores and Procter & Gamble Co., settled on the Universal Communications Standard.

Product wholesalers within the NWDA have already linked many of their customers — drug stores, hospital pharmacies and hospital clinics — into their EDI nets by providing proprietary terminals used to order drugs, foodstuffs and other supplies.

Benefits of such networks include elimination of paper transactions and associated administrative tasks, streamlined product ordering, shortened payment cycles, an abbreviated product delivery process and reduced product inventory.

Pharmaceutical wholesaler Bergen Brunswig, for example, has been renting the handheld devices customers use to order products since the late 1970s. These enable customers to transmit orders electronically to Bergen Brunswig's distribution centers.

Benefits of electronic transfers

Super Valu Stores has found that transmitting purchase order information electronically has drastically decreased the company's reliance on manual entry of this data.

Like Bergen Brunswig, the company also distributed proprietary ordering gear to their customers. Prior to electronic transmission of purchase orders, spotting, checking and changing errors cost Super Valu $10 per discrepancy.

The company's electronic document transmission system also enables it to inform its customers of product price changes and other time-sensitive information faster.

George Klima, accounting system and procedures director for Super Valu Stores, said that in the past, customer orders were mailed to the company and had to be manually entered into the firm's computer, an effort which tied up valuable resources. Automating this portion of the process has reduced the amount of time between receipt of orders and shipping of ordered products.

Tough sell

Although companies such as Super Valu have successfully automated the customer-to-wholesaler ordering process, persuading product manufacturers to hook directly to such a network has been a far tougher sell.

This dilemma has forced large users to enlist the aid of clearinghouses that handle document transmission between, for example, Super Valu and product manufacturers such as Ralston Purina Co. and Kellogg Co.

One EDI industry watcher said automating the supplier-to-wholesaler portion of the process presents major problems. "There are so many different suppliers a company does business with, it is difficult for all of them to be put on a single network," explained Victor Wheatman, a senior consultant with INPUT, a Mountain View, Calif.-based communications research group.

This issue would seem pressing for both Bergen Brunswig, which does business with more than 700 suppliers, and Super Valu, which deals with roughly 1,200.

Unattractive option

Wheatman said the cost, personnel and operation of EDI networks makes this option unattractive. "These companies have to open up to clearinghouses that offer attractive communications capabilities," he concluded.

Not all of the company's suppliers possess the same level of technical expertise in the field of communications, Super Valu's Klima added. This reality would further complicate efforts to establish a common link between the grocery wholesaler and its myriad of suppliers.

Part 2 of the series will look at one company's attempts to create a nonstandard EDI net that spans the chasm between its customers and its suppliers.

Northern may shed sales unit

continued from page 1

com spokesman said the Eastern region operation employs more than 1,000 sales, support and administrative staffers and is responsible for sales and service of the company's products in the six New England states, New Jersey, Delaware, Maryland, Virginia, Pennsylvania and Washington, D.C.

The source said the Eastern IOS unit is the company's only remaining direct regional sales operation. Northern Telecom also maintains a national accounts division for direct sales to large users.

In November, Northern Telecom sold its Western region sales and service arm — which consisted of 650 Northern Telecom salespeople, technicians and administrative personnel — to PacTel Information Systems, the equipment marketing subsidiary of Pacific Telesis Group. A month later, Northern Telecom sold the Midwestern arm of the IOS to Centel Business Systems for roughly $10 million. Over 200 Northern Telecom employees were involved in that shift.

The Northern Telecom insider told *Network World* the discussions between Northern Telecom and Nynex Business Information Systems are the result of an ongoing effort by the switch maker to revamp its private branch exchange distribution strategy.

The possible sale may be motivated by Northern Telecom's desire to eliminate so-called channel conflict, the competition between its direct sales force and distributors such as the RBHCs, many of which have signed multimillion-dollar contracts to market Northern Telecom's digital central office switches and ancillary gear. "We are hurting ourselves by hurting our own best customers," the source said. "There is no way we want to annoy them by competing with them."

A Northern Telecom spokesman would neither confirm nor deny whether the two firms were in negotiations but said in reference to the firms' relationship with the RBHCs, "[Northern Telecom President Desmond] Hudson has said he would not close doors on anything."

Nynex Business Information Systems would not comment on the matter.

If Northern Telecom sells its Eastern region direct sales and service operations, the move would likely surprise many users. In a statement distributed at the Northern Telecom SL-1 Users Conference in late April, the company told users, "We do not see any change in our distribution policy in the East in the foreseeable future."

The switch vendor currently sells PBXs directly through the Eastern region unit, the national accounts force, four RBHCs, a network of distributors, two major interconnects (Centel and Contel Corp.) and a group that services customers located in the government sector.

"We were stepping all over ourselves," the source said in reference to Northern Telecom's five PBX distribution channels.

On a number of occasions, user requests for proposal have been answered by several parties, all pitching Northern Telecom PBXs.

One member of Northern Telecom's Eastern direct sales group, who requested anonymity, raised doubts about the sale because it would pit Nynex against Bell Atlantic Corp. "I don't think Nynex would risk a turf war for this opportunity," the salesman said.

Industry watchers said the sale of the Northern Telecom group would benefit both the vendor and users. "This would be a positive move for Northern Telecom because it would significantly lower its operating overhead," explained Kim Myhre, vice-president of communications research at International Data Corp., a Framingham, Mass.-based research firm.

One industry watcher said that if Northern Telecom did sell its Eastern direct sales group to Nynex, the switch maker would likely move more products than it would through its current distribution system. "They are competing with themselves and there just isn't enough room in the market for everyone to sell their entire product line," explained Tom Schmid, a senior analyst with The Yankee Group, a communications consulting and research company based in Boston.

Hayes unveils modems

continued from page 2

The Smartmodem 9600 is available for $1,299 and its internal counterpart costs $1,199, or $1,299 bundled with Smartcom III software. The Smartmodem 2400 is priced at $899 and its internal counterpart is $849, or $899 bundled with the new software.

In addition to the new V-series Smartmodems, Hayes also announced a Modem Enhancer, Smartcom III communications software and a 33% price reduction for existing modem products.

The V-series Modem Enhancer attaches to any existing external Hayes modem to provide V-series technology. It is available between now and Sept. 30 for an introductory price of $199. Later it will retail for $349.

Smartcom III software for IBM Personal Computers and compatibles adds support for Kermit, a public-domain file transfer protocol; five variations of the XMODEM file transfer protocol; emulation of TTY and Digital Equipment Corp. VT-52 and VT-102 terminals; and a programming language dubbed Simple Communications Programming Environment (SCOPE).

SCOPE allows sophisticated users to develop menus to access data base services, such as those provided by CompuServe, Inc., without having to learn and repeat lengthy logon sequences.

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Visa increases net profit

continued from page 1

bers over one of Visa's two existing networks. Visa will take over the chore on Sept. 30 from General Electric Information Services Co. (GEISCO). GEISCO, which began working with CACHA in 1984, had signed on to handle ACH network tasks until the end of 1988. But after losing money on the agreement, GEISCO negotiated out of that contract last March.

The ACH duties expand Visa's role as a network services provider. The company already offers a stable of network services that support automated teller machine, direct debit card and other point-of-sale nets.

Visa, which is owned by the financial institutions that offer Visa credit card services, uses profits from the sale of network services to lower the fees it charges member institutions for processing credit card transactions. Lower credit card transaction costs allow institutions to issue more Visa cards and reap more charge card interest.

"It's our intention to offer as inexpensive a switching service as we can to support Visa card products," said Dick Lonergan, vice-president of clearing and settlement development. "The other services we offer, whether they are debit cards, automated teller cards or ACH processing, are really offered, in part, to subsidize that."

Visa will use its VisaNet Clearing and Settlement network to process ACH transactions for CACHA. That network is currently used to settle credit card transactions by electronically moving funds from a credit card-issuing institution to the accounts of merchants. Visa also has an on-line Risk Control net used for authorizing credit and debit card transactions that will not be used for ACH transactions.

"Bank-to-bank switching is right in the mainstream of our business," Lonergan said. "It was not in the mainstream of GEISCO's business." GEISCO, based in Rockville, Md., offers time-sharing services and had to build applications and switching centers to support CACHA transactions.

According to Peter Yeatrakas, executive director of CACHA, "Visa does bring a different dimension to the ACH process in that it is truly a banking industry processor, whereas GEISCO was not."

An ACH transaction is similar to settling a credit card transaction. For example, a corporation can provide a payroll batch file to an automated clearing house that will enable it to transfer funds from its financial institution directly to its employees' individual bank accounts.

The ACH system also gives individuals the option of paying their bills through direct deposit.

For the most part, ACHs rely on district Federal Reserve Banks for processing transactions. While nearly 90% of ACH transactions are still processed by the Federal Reserve, interest in private sector processing was spawned by the monetary control act of 1980, which ended the Federal Reserve's practice of processing ACH transactions below cost.

In addition to CACHA, the privately held New York ACH and the Arizona ACH offer private ACH processing for their members.

Yeatrakas says private sector processing has put pressure on the Federal Reserve to improve service and keep prices down. That pressure is also forcing the Federal Reserve to support electronic movement of funds, rather than just transferring magnetic data tapes between financial institutions. As with GEISCO, CACHA expects 100 of its members, located in California, Utah, Idaho, Nevada and Hawaii, to process more than a third of CACHA's approximately 10 million ACH transactions per month through the VisaNet.

The remaining transactions will continue to be processed either by the Federal Reserve or the Bank of America in Hawaii. "We're sensing there is no one dropping off the GEISCO system to go back to the Fed," Yeatrakas said. "They're all saying they're going to move ahead with Visa."

At its meeting in January, Visa's board of directors will decide if the company will expand its presence in the ACH arena. "If we were going to do this just for CACHA," Lonergan said, "I don't think our board would have let us do it."

According to Lonergan, the volume of CACHA's traffic will be high enough to allow Visa to make a profit with the service. Visa will charge $400 a month per member to process ACH transactions. That fee includes use of a personal computer, use of Visa-developed software, access to VisaNet and 10,000 transactions monthly.

Additional transactions will be processed for 0.95 cents each if both the sending and receiving financial institutions are served by VisaNet. The fee for sending a transaction from VisaNet to other processors, such as the Federal Reserve's, and for accepting transactions from other processors will be 0.7 cents each. The Federal Reserve fees range from 1 cent to 6.8 cents per transaction, depending upon the level of service.

Initially, Visa will provide a link between VisaNet and GEISCO in order to enable CACHA members to continue loading their remote job entry batch files from minicomputers or personal computers using dedicated or dial-up lines.

Next year, Visa will lease to CACHA members personal computers similar to Visa's Member Interface Processor Personal Computer (MIP PC). The MIP PC currently is used to load Visa card settlement files into VisaNet over digital dial-up or leased lines operating at speeds between 4.8K bit/sec and 9.6K bit/sec. Use of MIP PCs ensures financial institutions will be compatible with VisaNet's IBM Systems Network Architecture environment.

Visa will also next year allow financial institutions to use their own personal computers to dial into VisaNet and will provide direct links between a financial institution's network and VisaNet's IBM 3090 mainframes in San Mateo, Calif., and McLean, Va.

VisaNet users currently using IBM Series/1 minicomputers to load Visa clearing and settlement files will also be able to load ACH transaction files from that device starting next year.

CALENDAR

June 15-17, Dallas — Local Communications Systems. Contact: Systems Technology Forum, Suite 150, 10201 Lee Highway, Fairfax, Va. 22030.

June 15-17, New York — Localnet East Exhibition and Conference. Contact: Online International, 989 Avenue of Americas, New York, N.Y. 10018.

June 15-19, Atlanta — ISDN/'87: The Third International Integrated Services Digital Networks Exposition. Contact: Information Gatekeepers, Inc., 214 Harvard Ave., Boston, Mass. 02134.

June 17, New York — Alternatives for Bypass in the New York Urban Area. Contact: Advanced Communications Planning, Kimberly Drive, Westport, Conn. 06880.

June 17-18, Washington, D.C. — Systems Network Architecture. Contact: New York University, School of Continuing Education, 575 Madison Ave., New York, N.Y. 10022.

June 17-18, Branson, Mo. — Understanding Integrated Services Digital Network. Also, June 30-July 1, Dallas. Contact: Telecommunications Research Associates, P.O. Box 1200, Newark, Ill. 60541.

June 17-19, Arlington, Va. — Data Networks: Management, Operation and Control. Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

June 18-19, New York — Understanding IBM Systems, Products and SNA. Also, July 27-28, Chicago. Contact: TeleStrategies, Inc., 1355 Beverly Road, McLean, Va. 22101.

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▶ *PRODUCT REVIEW*

Virtually similar systems

COMMUNICATIONS SOFTWARE

BY JOHN J. HUNTER
Contnbuting Writer

In the past few years, users wishing to share data have shown much interest in virtual disk systems. The virtual disk concept, pioneered primarily by Micro Tempus, Inc. in its TempusLink product, allows personal computer users to adopt mainframe disk drives as extensions of the personal computer's disk system.

Such products, however, run under IBM's TSO, CICS and CMS operating systems — all noted for their high overhead. In addition, the priority processing scheme employed by CICS doesn't differentiate between production jobs and on-line users running in the same region, which degrades performance for these users.

Two virtual disk software systems that bypass TSO, CICS and CMS are Tangram Systems Corp.'s Arbiter and On-Line Business Software's Virtual Disk(ette) Access Method (VDAM). Both products run as applications under IBM's VTAM and handle interaction between the personal computer and virtual disk facilities.

Besides providing extended storage, these virtual disks furnish a central repository for data that users can share. Both products also let users access host data bases to extract application files such as spreadsheets. Arbiter and VDAM also perform the services needed to convert host-resident file formats and codes into a form that personal computers can use, eliminating the need to write such conversions.

Standard operating procedures

Both Arbiter and VDAM operate as separate VTAM applications, have top-down menus and let users upload and download files. Arbiter and VDAM are written in Assembler and run on the IBM Personal Computer XT, AT or compatibles under PC-DOS or MS-DOS 2.0 or higher. VDAM requires 20K bytes of random-access memory and 50K bytes of disk space; Arbiter needs 32K bytes of RAM and 200K bytes on disk.

Both systems operate with an IBM mainframe utilizing OS/MVS and ACF/VTAM. The host-site software needed to perform all virtual file services occupies 100K bytes of RAM with VDAM, while Arbiter takes 256K bytes. The personal computer-to-host link is handled by a protocol converter that makes the personal computer appear as an IBM 3270. (For a list of such products, see "Protocol converters feel peer pressure," *NW*, May 11.) The data transferred between host and personal computer is compressed.

Neither product requires users to change their normal operating procedures. The virtual disk is treated the same way as a local personal computer disk drive, with drive designation dependent upon the user's configuration. MS-DOS commands allow direct interaction with the virtual disk. Users can also take advantage of the commands listed in the top-down menus.

Virtual disk size and names are user-defined on both products. VDAM permits virtual disks to appear as single- or double-sided floppy drives with eight or nine sectors per track. The single-sided formats yield 160K and 180K bytes, respectively, while the double-sided formats give 320K and 360K bytes. VDAM also supports the 1.2M-byte Personal Computer AT format and a hard disk format with up to 32M bytes. Arbiter utilizes hard disk formats only and supports storage configurations from 6K to 32M bytes.

While Arbiter and VDAM allow any number of virtual files to be created, VDAM limits the number of files that can be active at one time to four; Arbiter allows eight. Both vendors claim that the number can be increased through software changes.

Arbiter permits multiple virtual disks to be associated with a single VSAM file; VDAM allows only one virtual disk per VSAM file. To activate a virtual file, users issue the same "calls" used in normal personal computer file handling. Once files have been established, both systems permit them to be marked private or shared, and read-only restrictions can be invoked.

In addition to working with their own VTAM files, Arbiter and VDAM permit data to be extracted from host data bases. The basic data extraction routines — those that can be done without requiring user-written application programs — work with "flat," nonhierarchical files such as Basic Sequential Access Method, Queued Sequential Access Method and partitioned data sets.

Arbiter and VDAM handle file reformatting, data unpacking and EBCDIC code conversion to transform data into a form usable by personal computers. They also reformat personal computer files targeted for storage on system files. Both products permit flat files to be sent to the personal computer in unconverted form, and users with Lotus Development Corp.'s 1-2-3 and Ashton-Tate's dBASE III applications can directly access virtual files with DOS commands.

VDAM currently is behind Arbiter in applications program support. With Arbiter, user applications written in COBOL, Pascal, Assembler and PL/1 can read and write personal computer files on virtual disks. These applications can also read and write files on hierarchical data bases such as IBM's IMS. On-Line Business Software claims that an applications interface supporting COBOL will be available by the end of this month.

Both units provide access to other mainframe subsystems such as TSO and CICS. Arbiter users can "hot key" between Arbiter and these subsystems while they operate concurrently. For example, users may initiate a file transfer under Arbiter and switch to TSO as the file transfer proceeds. VDAM does not have this capability.

Arbiter lacks VDAM's ability to operate with IBM's Job Entry Subsystem (JES) service. This permits VDAM users to submit jobs, check status, and cancel and receive outputs. The service is implemented via the Process Sysout facilities of JES, and it requires using the personal computer editor to write instructions using job control language (JCL) and to store them on virtual disks.

VDAM captures JCL data sets from TSO and other libraries. The principal use for the JES interface is to start mainframe application job streams that are dependent on the completion of personal computer processing events. Arbiter also has JCL facilities, but they are less extensive.

As jobs progress on both systems, an audit trail is generated and System Management Function data is captured to permit system administrators to judge system activity. However, Arbiter's systems administration facilities are much more extensive than VDAM's. The Arbiter system administration program monitors and controls all centralized functions of all attached personal computers. Arbiter also allows the system administrator to determine the type of protocol converter cards to be used or to display activity transactions. VDAM does not support those operations.

Users of both systems contacted by *Network World* say they are very happy with their choices. Two interviewed for this article had rejected products running under TSO and CICS because they were too slow and "ate" resources.

Ron Ebright, manager of technical support for Scientific-Atlanta, Inc. in Norcross, Ga., has been using Arbiter since last October. Ebright says Arbiter's top-down menu is easy to use and the overall speed of the product allowed his company to get rid of a Digital Equipment Corp. PDP 11/70 by moving its applications to an IBM mainframe. Ebright is currently working with flat files but plans to install a sophisticated data base in the near future. His only complaint is that Arbiter has no SQL data base interface, but he says that Tangram is working on this.

Mike Ward, a systems programmer with Miami-Dade Community College in Miami, is quite satisfied with VDAM. The college uses the system in a direct host-channel attach environment. Ward says he likes VDAM's speed, stating "the unit can copy a 30K-byte file to the host in 15 to 20 seconds." While that's pretty quick, remember that his terminal is connected directly to a host processor channel that operates in the megabit range; thus the only real limit on transmission speed is in the communications software — not in VDAM.

A timesaver

Ward also states that VDAM recently saved him a great deal of time. He needed to implement a communications software patch to the system's front end. NCR Comten, Inc., manufacturer of the school's communications processor, wrote the patch and downloaded it to Ward's electronic mailbox. Using VDAM, Ward then moved the software to an OS data set, entered the TSO subsystem and implemented the patch using JCL. Ward credits VDAM with speeding up and smoothing out the change process.

"The whole process took less than an hour from the time the patch was sent," Ward says, "compared with days if the patch had come through the mail and we had to rekey and verify it."

Both products are sold under license fees that are determined by the number of concurrent users the system will support. The prices shown in the chart include software required for both the host and mainframe for 10 to 50 concurrent users.

Data and communications managers could do much worse than choosing either the Arbiter or VDAM for their data sharing needs. While there are some differences between the two products, they offer the same basic functionality and features — and at a price considerably less than a local-area network.

Two virtual disk systems compared

	Vendor/Product	
	Tangram Systems Corp. Cary, N.C./ Arbiter	On-Line Business Software San Francisco/ VDAM
Host interface	IBM/VSAM	IBM/VSAM
Application program interface	✓	
Price	$12.5K to $40K	$12.5K to $37.5K

SOURCE: TMS CORP., DEVON, PA.

Hunter is president of TMS Corp., a marketing management consulting firm in Devon, Pa.

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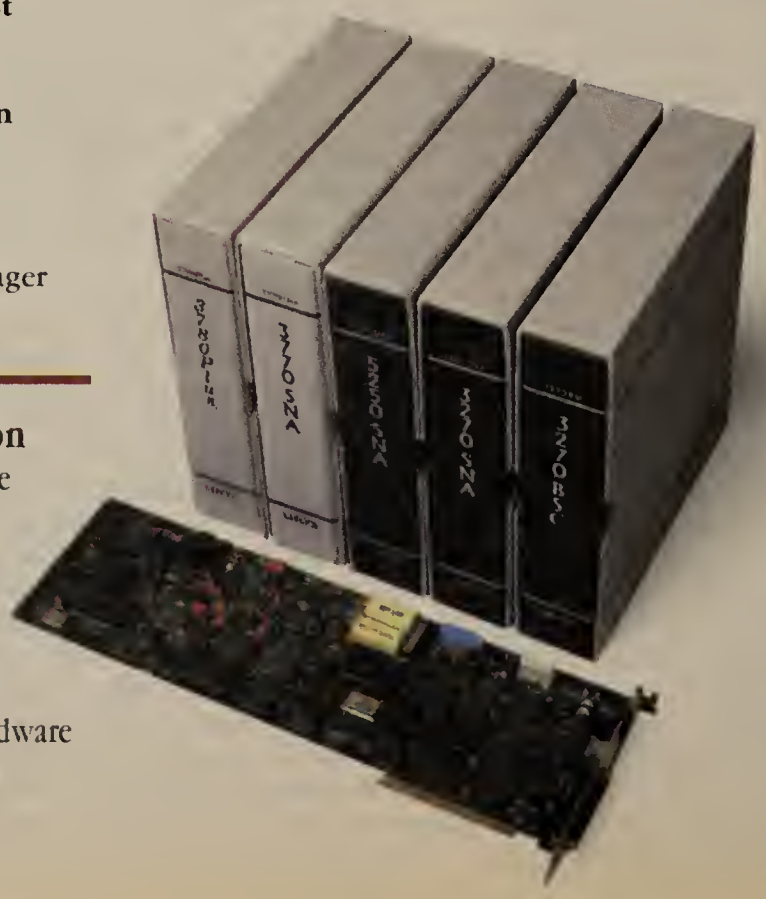

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